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Epidemic Diseases of Cats

DISCUSSION BY THE CENTRAL VETERINARY SOCIETY*

Mr. F. C. Holliday-Pott : A discussion on the Epizootic Diseases of the Cat is long over-due. Much confusion has arisen in both professional and lay circles over their terminology and is to be hoped that some clarification of the position may result.

Frequently one finds people discussing different diseases, each calling them the same name ; or the same disease, each calling them different names—names such as "show fever," "cat plague," "cat typhus," "kennel sickness," "influenza," "distemper," "cat diphtheria," "kennel ill," or "cat 'flu" and a host of others.

No doubt this confusion has arisen because of the relatively small amount of research work that has been done on the diseases of the cat and because of their obscure aetiologies.

Even a deep survey of the literature reveals little work done on the cat and here again the terminology is very loose.

For some time the term "distemper" seems to have been applied to nearly all the epizootic diseases of a highly contagious nature although of recent years in some circles it has come to mean a disease with the symptoms of a predominately respiratory nature.

Research workers studying the literature have suggested that, in the light of aetiological ignorance, we should name the diseases of the cat by their predominating symptom and in my practice we have adopted this proposal.

With your permission I am proposing to enumerate these conditions and their names as a basis for your discussion.

Infectious Gastro-Enteritis

This disease (often known as "Show fever") is undoubtedly the most important epizootic disease affecting cats.

This is an extremely infectious and highly fatal acute or peracute disease specific (in this country) to cats. Primarily kittens and young cats are attacked but cats of all ages are susceptible, especially the Siamese and Persian varieties. It not infrequently sweeps through a whole district with the virtual destruction of the entire young cat or kitten population.

Salsbery in America (and others) state that it occurs mostly in cold raw wet weather, but I see most cases in the hot weather, July and August being the worst months.

The disease is characterized by its sudden onset, a temperature (in the early stages) of about 103°, refusal to feed, profound depression, the cat often sitting huddled up and remaining motionless for hours at a time, sometimes with its head over a water bowl or sitting in a sink or even resting its nose on the floor, vomiting small quantities of frothy bile-tinged mucus, showing abdominal pain by a sharp cry after vomiting, or a cry when picked up or when the abdomen is palpated. There is seldom ocular or nasal discharge, usually no faeces are passed but there may be a diarrhoeic motion, sometimes tinged with blood. Death usually occurs within 48 hours, in pain or following coma and collapse, but some cases live up to five days. Death may be so rapid as to suggest poisoning.

The mortality is about 80 to 90 per cent. but the animals that survive remain immune to further infection. The period of incubation in artificially produced cases is two to four days and this appears to be confirmed in practice.

Hindle and Findlay in 1932 showed conclusively that the disease is due to an ultra-visible virus, and they reproduced it experimentally from filtrates of nasal material and organ extract after passage through a Berkfeld filter. They state that cultivable organisms isolated from sick cats are secondary invaders and are not capable of reproducing the disease.

Transmission of the disease does not require actual contact as the virus is contained in body secretions and flies will transmit to cases where there has been no contact with sick cases or infected blankets, utensils, etc., although these will remain very contagious for some time and can be a continual source of danger if not properly dealt with.

Post-mortem examination in the per-acute cases may reveal few or no changes. In less acute cases, characteristic lesions vary from simple congestion of the vessels in the sub-mucosa to an actual necrosis of the intestine. Sometimes altered blood is found in the lumen of the bowel and the wall of the gut is thickened. The lymphatic glands often show haemorrhages ; and enlargement of the spleen sometimes occurs.

Prophylaxis. Dalling suggested the injection of modified virus ; and produced a vaccine of formalized infected tissue.

This was a good antigen with high protective potency and when injected subcutaneously, using two doses at about a ten-day interval, produced a solid immunity which was sufficient to protect cats in shows and from the naturally occurring illness—this I proved repeatedly not only in the practice but with my own Siamese cats when I purposely subjected them to the risk of infection.

Unfortunately the immunity produced is not permanent and has to be repeated as required, usually about twice a year.

Dalling reported good results using a vaccine-virus method of immunization, and Kirk and Dalling successfully used hyper-immune specific serum for a passive short-lasting immunity. Unfortunately the two latter products have not been on the market.

Hindle and Findlay in their original work stated that they were unable to discover any characteristic blood changes or inclusion bodies. There was some evidence at first from blood counts of the presence of a monocytosis but later results were so unreliable that they felt no reliance could be placed upon this observation as a method of diagnosis.

In America, however, following an outbreak of disease in 1937, considerable work has been done by Hammond and Enders and by others. The symptoms of this disease are indistinguishable from those of infectious gastro-enteritis and no single bacterial species could be isolated with regularity from these cases.

The American workers demonstrated, however, remarkable changes in the blood in every case. This very important and striking finding is a fulminating early leucopenia or decrease in the white blood cells of the peripheral blood. This change is constant, and is considered a diagnostic criterion.

It is remarkable, inasmuch as it represents the only specific infectious form of panleucopenia, both granulocytic and lymphocytic that is due to a virus, in the annals of medicine, and they have designated the disease malignant panleucopenia or agranulocytosis.

Experimental work shows that the white blood cell count in normal kittens is fairly constant at about 10,000 per c.m. of blood. In leucopenia, however, on the day of spontaneous death the fall was usually about 1,000 to 1,500, and in a few cases there were counts up to about 3,000. The reduction includes all types of leucocytes.

The cause of death has not been established.

It will be interesting to hear when more research is carried out in this country on infectious gastro-enteritis if these characteristic blood changes are observed.

Catarrhal Fever

Catarrhal fever is the disease most likely to be confused with infectious gastro-enteritis. It is that which is, perhaps, above all others most often referred to as feline distemper, and in a mild case, as feline influenza.

This disease affects cats of all ages and may be acute or chronic; it affects the respiratory tract as well as the alimentary.

It is characterized in the acute cases by a severe conjunctivitis, lachrymation, sneezing, an abundant greenish-yellow discharge from the nostrils, salivation, stomatitis, sickness and/or diarrhoea, pharyngitis, foetid breath, offensive odour, bronchitis and sometimes pneumonia. Death may occur within 48 hours, but cases frequently recover. In less acute cases nasal discharge may remain and continue throughout life.

A milder form exists which commences with frequent sneezing and nasal discharge, at first serous but quickly becoming mucopurulent, salivation, lacrymation, pharyngitis, depression and disinclination to move. The appetite is regained when the throat condition improves and the nasal discharge clears up. The mortality is only about 20 per cent.

It has been suggested that this may be another form of infectious feline enteritis, but it is interesting to note that Dalling found catarrhal symptoms in cats where no virus could be demonstrated and found that cats immunized against infectious gastro-enteritis were not immune to catarrhal fever.

*At the meeting held on May 2nd, 1946, at The Conway Hall, London, W.C.1.

Contagious Ulcerative Glossitis

This is an infectious condition affecting cats and kittens of all ages and characterized by inflammation of the tip and edges of the tongue, which later develops into ulceration. The ulcers are confined to the anterior third of the tongue and later coalesce. There is often vomition of yellowish mucus, but this is not severe. The animal is usually presented with the history that saliva drips from the mouth; that the cat tries to lap water but does not complete the act, and that appetite is in abeyance. With the appropriate treatment the majority recover.

Beta Haemolytic Streptococcal Infection

In the last few years I have had a few cases in which I have suspected this organism, mostly tonsillitis and metritic conditions, and other cases in which whole litters of kittens die soon after birth. In the cases in which this has been confirmed I have to report good results using autogenous vaccine. One case I am thinking of especially was a Siamese cat with tonsillitis and a discharging metritis. After one course of vaccine and no other treatment the condition cleared up and after the second, six months later, I allowed her to be mated and she produced a healthy litter. She has since bred regularly.

I understand Dr. Hare is about to produce an authoritative paper on this subject shortly.

Miss Olga Uvarov: The Central Veterinary Society had a paper on "Distemper in the Cat" by Professor Dalling in February, 1935, at which the late Henry Gray attended, and in his characteristic way observed that "the learned gentlemen" had come to the same conclusions as he himself had held—30 years ago. No doubt had he been alive now, he would have added another eleven years in which so little progress as to clinical diagnosis and classification had been made.

The names of Henry Gray, Urbain, Hindle, Findlay and Dalling remain the corner stones of feline research, but contribution of later years is practically non-existent in this country.

On reading the literature on cat epizootics, its most remarkable points are (*a*) its scarcity in this country (as compared to others, *e.g.*, the U.S.A.), and (*b*) its vagueness in nomenclature. This is one of the great needs in revision in veterinary terminology, as our own prosaic word "distemper" seems to have covered up too many entities for far too long. Indeed, it appears that most of the infections which English cats have been allowed to indulge in have been, until quite recently, the one and only distemper—even if it varied in symptoms—when it could for convenience be designated as catarrhal, respiratory or gastric.

Mr. Holliday-Pott has very bravely dealt with the main part of the paper, and I should like to support him in most of his clinical findings, but from the start disagree with his short classification. Purposely I avoid using the word epidemic, as in this list there creep in some conditions that have not yet had time to be classified, and one almost appears to be an 'endemic'.

The classification that I have arrived at includes the following:—

1. Infectious Gastro-enteritis.
   Also named as: Show fever, Gastric 'flu.
   Occurrence: Great Britain, United States, France, Germany.
2. Infectious Feline Agranulocytosis
   Or Malignant feline Panleucopenia, Infectious Aleucocytosis of cats, Feline Leucopenia, "Distemper."
   Occurrence: America, Canada, Australia, Germany, Russia.
3. Catarrhal Fever
   Or Infectious Catarrh, Cat Influenza, Feline Distemper, Respiratory Distemper.
   Occurrence: Widespread.
4. Contagious Ulcerative Glossitis
   Prevalent in Great Britain, France.
5. Beta Haemolytic Streptococcal Infection
6. Infectious Broncho-pneumonia
   Reported in America.
7. Feline Virus Pneumonia
   Reported in America.
8. Salmonellosis
9. Tuberculosis

This classification may appear cumbersome, but collective literature allows for very little overlapping.

Infectious Gastro-enteritis

This has been ably dealt with by Mr. Holliday-Pott, but it is interesting to trace that this is one of the oldest diseases in cats on record. American workers[4] have traced it to as far back as 1414, when a peculiar wave of cat disease swept over Germany. In more recent times, 1900, Zschokke described it as a croupous infection, and suggested that *Bacterium coli* might be responsible. In 1922 Hutyra and Marek called it "pseudo-membranous enteritis" and some years later Verge, Cristoroni, Taberner, Leinhard, Gray, Urbain, Hindle, Findlay and Dalling all pursued and worked it out to its end. It is said to have travelled from India, where it was known as "Asiatic cholera of cats," to England and later appeared in France.

From the clinician's point of view, Prof. Dalling's[2] work is a great stand-by, and his clinical supporters, such as Mr. J. Stewart, Maj. H. Kirk and Mr. Smythe have all done much in discussions and clinical trials.

Without the means of prophylaxis and in the absence of hyper-immune serum, the treatment of this disease is most unsatisfactory. Extensive references can be found amongst French workers[3,5] as to terminology and treatment. Amongst some of the varied attempts at treatment the following have been included: calomel, stovarsol, uroformine (hexamethylenetetramine) congo red, calcium injections, various bacteriophages, *Bact. coli* serum, salol, charcoal, citrate of soda, vichy water, and later prontosil; the last is alleged to have reduced the death incidence (in France) from 80 per cent. to 54 per cent. From clinical discussions with veterinary surgeons one learns sulphaguanadine has been used—and that the results are not encouraging. The important consideration is to keep up the resistance of the patient and avoid complications at all costs. Non-specific vaccines are also employed, and a simple stimulant to tissue reaction has been used—intra-muscular injections of boiled milk[6]. Symptomatic treatment differs in different stages of the condition. Vivicillin appears to have no effect on the course of the disease. As yet, no reports could be found on the use of penicillin. The hope of the future is that prophylactic material will be available and many felines will be saved again.

Infectious Feline Agranulocytosis or Malignant Panleucopenia

This is the disease popularly called "distemper" in America. It is a complete and definite entity of its own. Clinically, as Mr. Holliday-Pott has said, this disease resembles our infectious gastro-enteritis, and it has even been suggested that it is caused by the same virus: this is not proved, and until we can get conclusive evidence on the haematology of our disease, the clinical similarity cannot be taken as diagnostic.

It has been estimated that there are 150 million cats in the United States of America (two-thirds of these are strays) and this disease has been extensively worked out. Lawrence & Syverton[12] in 1934 reported this disease as "spontaneous agranulocytosis" and in 1937 Hammon & Enders described an outbreak of it in Harvard. Since then extensive work has been carried out by these and other workers[11].

The disease is prevalent throughout the States, is endemic in some areas, and there are some parts, even rural districts, where it is impossible to rear cats owing to heavy infection.

The disease is defined as "an acute, common, infectious disease of cats, characterized by great depression of the number of lymphocytes and granulocytes of the blood, and extensive aplasia of the lymphoid tissue and bone marrow." It is caused by a filtrable virus. An additional pathological finding is the presence of intranuclear inclusion bodies (type A Cowdry) in the intestinal epithelial cells and in the reticular cells of the lymphoid tissue.

Incidence—mostly in kittens.

Incubation period—five to eight days.

Mortality—80 per cent.

Susceptibility—cats only.

Clinical Course: Symptoms are variable, but on the whole resemble those of infectious gastro-enteritis. The only diagnostic sign is the change in the blood picture. Prior to any rise of temperature or other symptoms, a fall in leucocytes occurs, which may represent a decrease of lymphocytes, polymorphs or both. In normal kittens the number of lymphocytes in circulation remains constant, despite wide physiological fluctuation in the total leucocyte count, and this is used as a significant indication as early diagnosis. The degree of leucopenia indicates the severity of infection. There is no appreciable effect on the erythrocytes. Study of lymph nodes and bone marrow during the incubation period and illness reveals that failure of leucopoeisis is the cause of the leucopenia.

The most marked abnormality is in the differential count: neutrophils, more markedly affected; lymphocytes—total number diminat the height of the disease.

Normal cats[9] only rarely show stab cells or non-filamented polymorphonuclear leucocytes. In some cases in this disease a slightly increased number occurs either at the height or a day before. Two types of blood picture are observed: (1) gradually declining—gradual decrease during the incubation period of both neutrophils and lymphocytes—and (2) precipitously declining type—when there is little change on the first day and then a sudden drop to zero. (Average white cell count 15,000 per cu.mm.)

If cats survive the first few days, an index of recovery is shown by reappearance of appetite and a rapid rise in the leucocyte count and the appearance of many unsegmented neutrophils.

Post-mortem Examination.—Chief findings are in the bone marrow. *Femur bone marrow*—instead of being sticklike and solid, it is almost fluid and does not shell out. On *microscopical* examination it shows congestion, haemorrhage and an absence of white cells. *Lymph nodes*—Ileocaecal glands are enlarged and softened. There is no evidence of inflammation or haemorrhage (as seen in cases described by Hindle & Findlay in infectious gastro-enteritis). *Spleen*—not greatly affected. *Small intestine*—little change—occasionally slightly congested. *Colon*—little change. *Other lesions*—very occasionally. Pneumonia, stomatitis, or changes in the liver, kidneys, brain, bladder, stomach, suprarenal glands, salivary glands or heart have never been observed. All tissues are infected; urine the least. In the majority of cases there is no time for secondary invaders to operate, although these can gain a good foothold in the absence of phagocytic cells. The cause of death has not been worked out.

Immunity.—Extensive work has been done by the Americans on immunity in this disease. There is:—

(1) *Natural Immunity*—resistance of female is passed on to its offspring *via* the placenta—this is only of short duration unless strengthened by exposures.

(2) *Passive Immunity*—if hyperimmune serum is given within three days of exposure it is effective.

(3) *Active Immunization*—only for animals not exposed to natural infection. This consists of injecting 1 c.c. of 10 per cent. attenuated virus suspension (spleen of infected animals) in two doses with an interval of seven days. Duration of immunity is not known

This disease has changed its name in the last few years, as research workers have realized that the term "malignant panleucopenia" implies fatality, whereas many cats have a natural resistance, so there is a tendency to drop the word "malignant" and in later works this disease is known as "infectious feline agranulocytosis."

As this disease has been compared to infectious gastro-enteritis, it is to be hoped that blood pictures will be investigated in order to avoid an error in diagnosis.

It would be interesting to know if a similar infection has occurred or does occur in this country, as the incidence of enlarged chronic ileo-caecal glands in old cats is quite appreciable.

Catarrhal Fever

I was looking forward to learning the causes of the following two diseases, but Mr. Holliday-Pott, being a wise clinician, has left it to the bacteriologists who may be expected to take part in the discussion. As with all clinical papers treatment is automatically demanded, and in discussing treatment one has to confess to diagnosis. This disease can be most trying in its occurrence and treatment. The early cases respond to sulphonamide therapy plus feline catarrhal vaccines, whereas the milder cases, I have found, often occur as legacies of infectious gastro-enteritis. These milder cases mostly remain as chronic snuffling rhinitis cases; muco-purulent discharge can reappear at intervals, particularly if the resistance is lowered.

It is interesting to note that the few cases one has had a chance to examine *post- mortem* have shown macroscopic lesions in the nasal cavity only. The mucous membrane appeared inflamed and covered with mucopurulent exudate; the pharynx, trachea and lungs were apparently not involved. Smears of the discharge have shown Gram-negative coccobacilli, which on culture appear to belong to the *Pasteurella* group. It seems that the *Pasteurella* appears as a complication rather than the cause of these chronic rhinitis cases. Sulphathiazole and nasal hygiene have been tried—results are variable.

Contagious Ulcerative Glossitis

The literature on this condition is very scanty, and it is not possible to trace one definite cause of this painful condition. In the past it has been considered to occur as a complication of infectious gastro-enteritis and catarrhal fever, but in recent years one encounters cases that clinically are purely a glossitis.

French workers[8] suggest that some normal inhabitants of the buccal mucosa become pathogenic as the result of some weakening factor. Streptococci and staphylococci are incriminated. It is possible that bacterial as well as nutritional factors are involved. An experimental type of glossitis (similar to pellagra in man) has been produced in cats on a nicotinic acid-deficient diet. Thus the role of bacteria may be of secondary importance. Clinically these cases respond to sulphapyridine in this country and sulphathiazole in America.

Beta Haemolytic Streptococcal Infection

This condition alone could fill a discussion. Many clinicians disagree with the recognition of this syndrome, but one encounters these cases in various forms on very many occasions.

Feline B.H.S. appears to be prevalent and is even more unconquerable, so far, in its clinical form than is the condition in dogs. It simulates canine B.H.S. in pharyngeal, tonsillar and skin symptoms, and in its early stages shows response to autogenous vaccine. Most intractable is the skin lesion—which takes the form of either dry exfoliated dermatitis or pustular eruptions along the spine. Mechanical interference by persistent licking often aggravates the picture and a moist eczema-like lesion is the result. It is to be hoped that further work will be done on this condition, as up to now one encounters too many chronic cases where prognosis is grave and treatment unsatisfactory.

In conjunction with feline B.H.S. and at times as its complication, one has to consider the incidence of coccidia. Coccidiosis in these cases produces toxaemia, at times quite profound, and anaemia, with resultant watery discharges from the conjunctivae, nasal and other mucosae. The whole picture is not clear-cut from the clinician's point of view, as on treatment of coccidiosis there is very often no relief from the mucosal discharges, which often are persistent.

Feline Virus Pneumonia—In U.S.A.—is uncomplicated.

Infectious Broncho-Pneumonia—due to *B. bronchiseptica*.

These two conditions are of slight significance.

Salmonellosis

There are a few vague references[1] to this organism in the literature of cat diseases. I have been fortunate to hear from a private communication from Mr. H. B. Parry[13] about the incidence of this organism as the cause of a separate infection. It occurs in kittens mostly under three months, when it is highly fatal; older animals recover almost spontaneously. Kittens generally die within one to two days. The symptoms are diarrhoea, staring coat and capricious appetite. Older cats if affected show great lethargy. There are no catarrhal symptoms.

The disease appears to be due to faulty hygiene, with contamination of utensils. It disappears on improving conditions and appears to be self-limiting in older cats.

Salmonella enteriditis has been isolated from the gastro-intestinal tract. *S. typhmurium* has been isolated in Holland and *S. enteriditis* in Germany.

Tuberculosis

This is only mentioned to complete the list of infectious diseases and to hear the experience of other members.

In the cat, it appears to be mainly alimentary with enlarged foci in the mesenteric lymphatic glands. At times the liver is very enlarged, and lesions can extend into the thoracic cavity.

These remarks were to have been based mainly on clinical observation, but by the courtesy of the Imperial Bureau of Animal Health I was able to consult extensive literature in these diseases.

It is difficult to ask clinicians to do more than they are doing, but research into feline diseases in this country is an open field, and although the species is not of national importance, the advancement of research into these feline diseases is very vital to the veterinary profession and to the very many cat-loving owners. The commercial aspect could be included, but my main plea for further information is not only to alleviate the cat's discomforts, but also to show that our profession is not disregarding one of the most popular, as well as useful, pets of the average home.

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General Discussion

Major Hamilton Kirk, who opened the general discussion, said that he was rather unhappy about Mr. Holliday-Pott's nomenclature. He described what he (Major Kirk) called specific enteritis as infectious gastro-enteritis. He had made scores of *post-mortem* examinations on affected cats and he did not find gastric lesions; it was essentially an enteritis; in fact it was not unusual to find no more than a slight congested area in the jejunum. Diarrhoea was not a feature, and the emesis was a reflex from the intestine. Panleukopenia of cats, as described in America, did not refer to distemper but to feline enteritis.

Dr Hindle had been referred to many times. Years ago (about 1922) he gave

an address at the Royal Society of Medicine which he (the speaker) attended, and having described faithfully the symptoms of cat distemper to the last detail, Dr. Hindle then said it was infectious enteritis. They would all be hopelessly at sea when talking of cat diseases unless they recognised cat distemper and cat enteritis as specific and separate diseases. Prontosil was supposed to be of value in enteritis of the cat, but actually it was not of value. How could it be expected to be of value when one was dealing with a virus disease? Neither prontosil nor penicillin had any action against viruses and at the moment there was no dependable or specific treatment for infectious enteritis. Whilst there was little that one could usefully do, he agreed that when one was called in, the owner expected one to do something, and an intelligent attempt must be made to ease the pain, raise the temperature and check the emesis. Many cases that died within 24 hours had no lesions at all, or no discoverable lesion, and one wondered what actually caused death. We had a lot to learn about feline diseases. As regards so-called infectious glossitis, he doubted whether it was infectious. He had seen it occur during enteritis and during distemper, and also in the absence of either; and the fact that it was easily cured by local treatment did not lend colour to an infection theory. He usually painted the lesion once or twice with tincture of iodine and in practically every case the owners said the inflammation departed and the cat commenced feeding. Internal treatment had seemed unnecessary.

Mr. T. L. Wright: Was there a possibility of diphtheria in the cat? He had a clear personal experience 25 years ago. One afternoon a tom cat was brought in to him showing symptoms of diphtheria and he thought it had better be destroyed. It bit his hand and though he applied an antiseptic, by the evening his hand was three times the normal size. He was in close touch with a bacteriologist and went to him with the intention of having an autogenous vaccine prepared. A few days afterwards he saw him again and he was mystified, as the only organism was similar to the human diphtheria organism but very attenuated. He had applied two antiseptic dressings and these might have attenuated the organism. He would like to hear of anything which could be classified as diphtheria in cats. Cases of glossitis in cats very frequently came singly and could be in contact with other cats without spreading infection. Treatment was local application of stock zinc sulphate and boric acid lotion on the tongue and, provided the cat was spoon-fed, it recovered in a few days. He would like to know if anyone had any ideas of the possibility of cats acting as carriers of the condition commonly called 'flu. It struck him that in one or two instances, frequent visitors to their place, at each visit appeared to have been the starting point of outbreaks of 'flu. One old cat nearly always seemed to spread 'flu through the place.

Mr. G. E. Joss: He would like to ask Miss Uvarov whether, in her experience, the dermatitis which she considered was due to B.H.S., was chiefly found in castrated males, as in his experience these cats seemed more prone to this type of dermatitis. He was doubtful whether the causal organism was B.H.S. Miss Uvarov mentioned a chronic diarrhoea due to *Salmonella* organisms and said that this trouble resulted in chronic enteritis and death. In his experience the cats he had attended with this chronic diarrhoea had been otherwise normal; this foetid diarrhoea, however, defied the usual lines of treatment, but seldom resulted in death. Had Miss Uvarov any suggestions for treating this trouble?

He had been told that to maintain an adequate blood concentration of penicillin in a 30 lb. dog the dose required was 20,000 units every three hours. Claims had been made by commercial firms concerning cures by certain sulphonamides, these claims seemed to have been made without previously conducting clinical or field trials. He thought that the Editorial Committee of *The Veterinary Record* should make sure that these claims were correct before they were allowed to go to print. The same remarks applied to some other drugs and biological products.

Mr. L. R. Geffin: With gastro-enteritis it had been his practice to give large and frequent injections of glucose-saline at body temperature, and he found he had far greater success than with a sulphonamide or other internal medication. He had used vivicillin but glucose-saline, half a pint, three times daily, would usually produce a good effect. As to Mr. Wright's remarks, he remembered seeing a cat spayed; while being anaesthetised it bit the kennel maid. Later her hand swelled up and she was in danger of losing it. She was sent to the local hospital and a diphtheria germ was isolated from her hand. The cat recovered from the operation. A few days later she developed diphtheritic membranes at the back of the throat and was treated symptomatically. The cat recovered and so did the kennel maid's hand. On the question of carriers, he frequently saw cats that had never been out of doors and had never been in contact with other cats, that were apparently safe from one of the other infectious diseases and were nevertheless suffering from "cat 'flu" or gastro-enteritis. There must be some method whereby these one-room confined cats did receive infection. He had a cat which had never been out of doors and never in his surgery, but none the less it developed a severe attack of gastro-enteritis and died. He presumed he was the carrier. He had a second cat which was attacked and she recovered. She had been with him 15 months since recovery and had never contracted it again: presumably she had developed some form of immunity.

Miss Hernaman-Johnson: This subject had interested her for a long time, having had kennels in which she kept cats, and had had recurring trouble from time to time. She agreed that far more gastro-enteritis arose in the summer than at any other time, and assumed it was due to the fact that there were a greater number of cats in the kennels in summer and a large number going home with the disease, later spreading it round the neighbourhood. She was interested in Professor Dalling's immunity. She wondered why it did not become permanent if the cat was injected and then exposed to natural infection, such as occurred at shows. Miss Uvarov had said that some mild cases of catarrhal fever led on to enteritis. That was what she had always contended. To her mind one cat started the infection in a kennel and then one got a variety of manifestations, no matter whether the original symptoms were catarrhal or enteric. As to the cat with glossitis: treatment appeared to be of no avail; a few days lapsed and the cat died. She would be interested to know if anyone had had that experience. They had two cases recently, revealing that almost necrotic patch on the back of the throat, and running no temperature. She agreed that some cats were apparently healthy carriers. She had also been called to a number of cats which never were out of doors and which had contracted a condition clinically similar to that which occurred in cats allowed to roam and which thus had the opportunity of direct infection. These must have been infected by air-borne means, only flies, humans, etc., acting as passive carriers.

Mr. D. D. Ogilvie. He must confess that he knew really very little about cats, but he should like to make one or two generalizations. Major Kirk was not quite accurate in saying that the sulphonamide drugs had no effect on any virus diseases. There were two virus diseases in man, trachoma and lymphogranuloma inguinale, which both responded to sulphonamide therapy and in the veterinary field there was one disease which might be considered possibly in the same category. That was fowl paralysis, which the work of Wilson and others had shown fairly conclusively to be due to a virus infection and against which Asplin had demonstrated a range of sulphonamides to be effective. He did not think, therefore, that we should entirely abandon trying to use some of the sulphonamides against some of the virus entities.

Miss Uvarov had spoken of the scarcity of published information on cat diseases in British literature, especially when compared with that of American origin. It was a pity we did not publish more. Most of the knowledge on cats was not held by veterinarians but by biologists, particularly those working in large commercial or other laboratories. All types of incidental disease, response to physiological, pharmacological or other interference, were studied by the biologist, but curiously either they did not wish to or did not think it worth while to publish their results. If there was some way of collating this material he was sure we could get a lot of information from them.

One thing which again came to him forcibly when listening to the papers was the weird and wonderful selection of sulphonamide drugs which were trotted out whenever a series of diseases was discussed. One found it dimcult to decide on what scientific basis a different sulphonamide was selected for each particular condition. He understood that a paper on the differential use of the sulphonamides in the veterinary field, setting them for the first time on a justifiable basis, was soon to be published. This should meet a long felt need since clarification was long overdue.

Finally, he would like to ask, on the question of coccidiosis, whether Mr. Pott or Miss Uvarov ever encountered any clinical cases of pure coccidiosis in the cat comparable with the disease in the bovine and the chicken. One got reports of coccidia being found quite frequently in the faeces of cats, but there was nothing much in British literature on the subject of coccidiosis as a clinical entity. One had recentiy had reports that D.D.T. was somewhat toxic to cats and he would like to ask also whether the essayists had had any experience in this direction.

Mr. Harvey Clarke: He was particularly interested to hear catarrhal fever and infectious gastro-enteritis described as distinct and separate diseases, caused by different viruses. This view was new to him and was of particular interest, as at least one eminent bacteriologist regarded catarrhal fever and infectious gastro-enteritis as different symptoms of the same disease and both as sets of symptoms due to secondary invaders following infection with the same virus. He asked the speakers what evidence they could put forward to show that these diseases were in fact distinct from each other, and due to separate causes.

Mr. F. H. Stainton: He congratulated the two essayists on the mass of material they had provided; this needed some digesting. He had got into the habit of classifying clinically this so-called cat distemper, 'flu or enteritis roughly into four classes. That apparently would not do. He agreed to a large extent with the remarks of Major Kirk. He had tried penicillin and vivicillin without success—in fact, one became sceptical of any control at all. As regards M. & B. medication, he found it difficult to discriminate between sulphaguanidine and sulphathiazole and would like some enlightenment. He thought Miss Uvarov mentioned intra-muscular injection of boiled milk, which he supposed was in the nature of a protein reaction which might, of course, be useful. Results of serums given to cats and dogs might be explained in the same way.

There were, no doubt, carriers, and he himself had come across cats in isolated flats which developed all the symptoms—so someone must have carried it there. He did not think there was any real immunity. He had knowledge of a cat which had had at least four attacks although each successive attack had been less severe. That cat could be a carrier.

Miss J. O. Joshua: She believed Mr. Pott referred to cases in which cats recovered from catarrhal fever had a persistent nasal discharge. Had he any explanation of the occasional case one met in which there had been nasal discharge from early kittenhood, but which on examination was found to be bacteriologically sterile?

With reference to the dermatitis which some workers attributed to streptococcal infection, she had found this condition responded in a large proportion of cases to administration of Murnil (Bayer). Some workers had attributed this condition to an all-fish diet, and it must be admitted that some cases recovered as a result of change of diet alone. She would like to ask how the essayists would classify the occasional cases in which the cat was dull and off food and ran a high and persistent temperature, often 106° F. to 107° F. No other symptoms developed and such cases responded reasonably well to sulphapyridine.

She had not observed any cases of diphtheria but had seen cases with ulcerated areas in the pharynx, situated central to the tonsils and which were certainly covered by a type of diphtheritic membrane. Some such cases were obstinate, but most cleared up with ordinary hygienic measures. She agreed that ulcerative stomatitis was a separate entity and had always regarded it as infectious, although not markedly so. By that she meant that one often met a rise of cases in a district during a certain period and might then not see such a case for a period of weeks or months.

Professor J. McCunn: Cats and cows were mysterious animals and no-one knew much about them. If the answer could be given satisfactorily how to make a cat eat and restore its appetite it would enable them to do away with many medicines. They would refuse to eat or drink when there was apparently nothing wrong. If one could once get them started eating it did not seem to matter how seriously ill they were or had been, a great percentage would recover. Could the speakers give them any guidance? In some cases ryzamin B. seemed to work wonders, but there had been as many disappointments.

Mr. T. L. Wright: He used the maxim that if one could keep the cat fed and nourished it would get over 'flu. As long as it kept anything down it stood a good chance of getting better, and spoon-feeding helped. When the throat was sore and swallowing was difficult that cat exhausted itself in resisting. There was a knack in feeding by spoon to avoid distress, but with retching and fighting the feeding did more harm than good. A lot got over catarrhal fever and enteritis.

Miss M. J. Freak: Apropos of Dr. McCunn's remarks on feeding, she had tried, in a number of cases recently, where there had been difficulty in feeding, giving casydrol, i.e., pre-digested, hydrolysed protein in conjunction with vitaminized glucose (plus vitamins B1 and B2, nicotinic acid, vitamin C and citric acid). She had found it of great value in maintaining bodily condition where force-feeding had to be adopted, as it could fairly easily be given by mouth in liquid form. It did appear to prevent that rapid loss of muscle which would otherwise occur in a case where protein intake was nil owing to inappetence or vomiting, and it also seemed to be well tolerated by cases that vomit other food.

The Replies

Miss O. Uvarov: Major Hamilton Kirk was usually very constructive on cat diseases: that day he had been destructive. He had said that the Americans were quite sure of their cat diseases—but they were not. They had worked out the aetiology and symptoms of feline agranulocytosis, published a good deal of literature, and yet in some references the name "distemper" was still to the fore. Major Kirk was hard on the fact that the use of prontosil was mentioned—this was done, not because it was used here—but because French workers *had used it* in the past, and produced results by which the mortality was reduced from 80 per cent. to 54 per cent. Personally, she thought these might have been secondary infections in enteritis cases. But if the figures showed reductions in deaths, they could not disprove them but only quote them—and that was all that was meant. He doubted whether ulcerative glossitis was infectious—so many contacts got it that one had to be suspicious of this. His local treatment of painting the ulcers with iodine sounded most

drastic; the resistance of these patients must be very high to withstand such drastic measures.

Chronic rhinitis cases did appear to be carriers, and often broke down themselves if their resistance was reduced. Mr. Joss asked about B.H.S. infection in male cats—it appeared that it was prevalent in both sexes—the females apparentiy passing on the infection to the young. His cases of chronic diarrhoea sounded more like enteritis and colitis—in these there was no specific treatment. One of the most useful treatments had been found in the administration of bis. *c.* pepsin mixture, which some cats had to have for years; in most cases these were enlarged ileocaecal glands patients. Injections of glucose and saline were very good in theory, but were difficult in practice, owing to the bulkiness of the injection.

Mr. Ogilvie mentioned sulphonamides and the poverty of literature in this country on their use in cat diseases. A good deal of very useful material was wasted, because those doing the work did not write it up.

The question of coccidiosis was a difficult one. She preferred to speak of the presence of coccidia rather than admit that coccidiosis occurred as a clinical form. Catarrhal exudate was very difficult to remove in the case of a coccidia-infected animal.

Mr. Clarke was very interested in glossitis—it did appear that some weakening factor was present and that the bacteria might be of a secondary nature.

Miss Joshua asked about nasal discharges. She (Miss Uvarov) considered there were several conditions in which these were present, but in the chronic cases of rhinitis there was often a previous history of enteritis, and often it appeared that the catarrh was a chronic inffection of the nasal mucosa. She had not encountered the condition, mentioned by Miss Joshua, of high temperature only in cats. It was as well to bear in mind that more than one virus had been described in felines. The American workers had isolated several.

Professor McCunn wanted to know how to make a cat eat, and thereby raised a difficult point. Cats were difficult patients. Gastric stimulants were often indicated, provided there was no vomition; in the old days quinine was effective. Miss Freak had suggested casedrol if the cat was able to retain it.

Mr. Holliday-Pott: He was relieved to hear from Major Hamilton Kirk's remarks that he agreed so much with what he had said. Major Kirk, however, questioned whether gastritis occurred in infectious gastro-enteritis and did not himself think that the vomiting was due to gastritis. He (the speaker) agreed that most *post-mortem* specimens did not show this lesion but that was because most cases did not live long enough for the gastritis to arise. In the cases that survived several days this symptom was frequently present.

He was interested to hear of Mr. Wright's and Mr. Geffen's experience of diphtheritic organisms being found in injuries of the hand. In bacteriological examinations of 300 cases Hindle and Finlay found no diphtheritic organisms and he understood that bacteriological cultures of the pseudo-diphtheritic membranes from the cat had been examined and that the true organism of human diphtheria had not been found.

Mr. Wright also mentioned carriers of influenza and asked about the cat. In infectious gastro-enteritis practically all the body discharges contained the virus and when contained within these discharges it remained virulent for a considerable time. So infectious was the disease that it was frequently brought home whatever the precautions taken.

He agreed with Mr. Wright that if the cases could be kept eating they usually recovered.

Mr. Joss asked about the use of penicillin and although he hesitated to enter into a discussion on this subject, he would just like to say that he agreed with him that the dose usually suggested of 12,000 to 15,000 units was quite insufficient and that nearer to 20,000 units must be given. He had spoken to bacteriologists with considerable experience of that agent and they had told him that in the body it was quickly destroyed, and so it was essential to keep on stepping up the dose every two to three hours. One of the difficulties was the continuation of the three-hourly injections day and night, not to mention the pain caused, and in the human patient this had been overcome by the continuous drip method, but this was impracticable in our patients.

It was said that vivicillin was quite useless and his limited experience in the smaller animals tended to endorse that view. More important in the cat was the use of glucose-saline injected subcutaneously; he preferred it to the majority of the therapeutic agents usually recommended.

Miss Hernaman-Johnson asked why the immunity was not permanent after the injection of formalized vaccine. He did not know why, except that in the case of canine distemper vaccine immunity must be converted into a permanent immunity by using virus. Dalling suggested that the immunity lasted only two or three weeks. In practice, he started giving it twice yearly in the majority of cases and hoped that the immunity would last that time. In most cases it was successful but there were a few that broke down and he started immunizing three times a year and found that this was sufficient.

Miss Johnson also mentioned catarrhal fever often leading on to infectious gastro-enteritis in kennels. He accepted that this did occur in catteries but thought that it was due to the presence of both infections.

Mr. Ogilvie said that coccidiosis had been described in the cat, but he had not seen any cases in which he suspected this organism and so had not been able to send any specimens for microscopical diagnosis.

Mr. Harvey Clarke asked if glossitis was a separate entity and suggested it was a late symptom of catarrhal fever. In contagious ulcerative glossitis he was thinking not of the circumscribed ulcers that appeared on the centre and posterior thirds of the dorsum of the tongue and the hard palate, but the peculiar ulceration that arose and confined itself to the anterior third of the tongue. The lesions were often multiple but usually coalesced over the anterior third of the tongue. Strangely enough, there was a small epidemic in his district at the moment, the cats showing no other symptoms except inappetence. They all appeared to be recovering on very little and simple treatment.

Mr. Clarke also asked what evidence there was of infectious gastro-enteritis and catarrhal fever being separate entities. Dalling found catarrhal symptoms in cats where no virus could be found and succeeded in immunizing cats against infectious gastro-enteritis. This, however, conferred no immunity against catarrhal fever. In America infectious gastro-enteritis was found where no bacteria could be demonstrated; but if the cases survived some time then bacteria could be isolated.

He knew very little about the toxicity of D.D.T., but the first shock he received with this preparation was when a woman brought a dead young cat into his surgery saying that she had brought some D.D.T. in a popular store an hour before, had dusted it on to the cat and it immediately showed signs of distress. Thinking that she had done something wrong she picked it up and ran round to the surgery: it was dead on arrival. A *post-mortem* examination revealed no cause of death, and he could only presume it was due to the powder.

Miss Joshua mentioned the continuous nasal discharge seen from some cats all their lives. He had been worried over the same condition and in a conversation with Dr. Hare was told that it was usually a mixture of *Br. bronchiseptica* and B.H.S. infections. He understood his feline anti-catarrh vaccine contained both these organisms.

Dr. McCunn asked how to make a cat eat during an illness. He agreed that this was a very important matter, as a cat that continued to eat would usually recover, whatever treatment was given. He had found that a cat would not eat if it could not smell its food and his first attempts were to clear the nose so that it might do so, remove the discharges, smear a little vaseline on the nose, subject the cat to inhalations of tr. benz. simp., and then apply one drop of an ephedrene preparation on to the nasal orifices. Medicines that sometimes helped the appetite that he had found very useful were rhyzamine B (already mentioned) and pills containing half a grain of iron, quinine and a little nux vomica.

ANNOTATION

The Cattle Plague

Every animal species is afflicted with one or more diseases which, if uncontrolled, may decimate the population. Cattle plague, or rinderpest, is undoubtedly the most serious disease of cattle and its history has been described in an outstanding monograph by Gamgee (1866). There is good evidence that it spread westward from the banks of the Don and the Volga towards the Danube during the invasions of the Goths. About A.D. 800 we first hear of a specific plague of the ox tribe in Europe. The disease probably first occurred in Great Britain in A.D. 810 and the country was again invaded in 1225. Europe was invaded at intervals during the Middle Ages and it is estimated that during the 18th century 200 million cattle died of rinderpest. It was these great epidemics during the 18th century that were largely responsible for the foundation of the veterinary colleges throughout Europe. The disease probably entered India long ago through the N.W. and N.E. Frontier provinces (Sarwar, 1941; Gopalakrishnan, 1941) and it was the report of the Indian Cattle Plague Commission (1871) which led to the establishment of the Imperial Bacteriological Laboratory, now the Imperial Veterinary Research Institute (Sen, 1941). The great African epidemic began in the Upper Nile in 1889, reached Lake Nyasa in 1892 and passed through the fly belts to the Zambesi by 1896 (Du Toit, 1939). It provided a potent stimulus to veterinary research in Africa which eventually resulted in the establishment of the Onderstepoort laboratories.

In 1711 Ramazini showed that the disease was spread by contact and a few years later slaughter of affected animals and sanitary measures were prescribed for its control by the College of Medicine at Geneva. Quarantine measures were advocated at about the same time, but it is not surprising that this rational approach was soon forgotten in an age when superstitious beliefs dominated the outlook on disease (Curasson, 1932). In 1714 there was a serious epidemic of rinderpest in Great Britain and a commission under the chairmanship of Mr. Bates, Surgeon to the King's Household, recommended the slaughter and burning of diseased animals, together with other enlightened sanitary measures. The recommendations were quickly acted upon and the epidemic brought under control within three months (Gamgee, 1866). Another invasion occurred in 1745, but Government action was tardy and it was not until 1748 that compensation was offered for "every beast showing the slightest mark of infection." In addition there was legislation controlling the movement of cattle, but the disease had spread widely throughout the country and persisted for at least 15 years.

In the middle of the 19th century rinderpest was widespread on the Continent and the proceedings of the first two International Veterinary Conferences in 1863 and 1865 (which are published in Gamgee's monograph) were largely taken up with discussions on methods of control. Commerce had now become a more important means of spread than wars and Gamgee repeatedly warned against the danger of importing cattle or their products from Europe, and in April of the year 1857 an order to ban importation was passed, only to be revoked in November of the same year. In 1865 infected cattle from St. Petersburg were disembarked at Hull—the disease rapidly spread to London and from there to all other parts of the country and to Holland. Again, despite Gamgee's teaching, action was tardy, some influential medical men believed that "treatment" should be applied and it was not until 1866 that the Cattle Diseases Prevention Act was passed. It provided for the compulsory slaughter with compensation of affected animals and cattle plague was eradicated in 1877. The experience gained was embodied in the Contagious Diseases (Animals) Act, 1869, which conferred extensive powers upon the Privy Council, through its Veterinary Department, to deal with animal diseases by the classical methods which have been so successful in eradicating the chief animal plagues from Great Britain and most other civilized countries.

The filtrability of the rinderpest virus was demonstrated by Nicolle and Adil-Bey (1902), but "vaccination" against the disease with infected secretions was first practised in 1744 and in the great African epidemic of 1890 the Boer farmers used infected bile for immunization; a method which was further investigated by Koch and Eddington (see Eddington, 1899). The protective value of convalescent serum was demonstrated in 1893 and an active immunity with the serum-simultaneous method was demonstrated soon

afterwards. More recently vaccines made from spleen, lymph glands and lung, inactivated in the presence of formalin, glycerol, etc., have been developed and all the earlier work on the various methods of immunization has been reviewed by Curasson (1932). Daubney (1933-37), Bennet (1936) and Colson (1939) have published further work on the use of inactivated vaccines. The general conclusions from a wide application of all the above methods is that convalescent or hyperimmune serum produces an immunity for about ten days (Stockman, 1905) and that the serum-simultaneous method produces a solid, and probably lifelong, immunity; the disadvantage of both these methods lies in the high cost of producing serum. Inactivated vaccines were of great value in helping to eradicate rinderpest from Ceylon (Anon., 1943; Crawford, 1946), but it appears that the immunity they produce is rather irregular and does not last for more than a year. If attenuated live virus is given soon after injection with an inactivated vaccine the reaction is sometimes "blocked out" and a permanent immunity not always produced. Stockman (1905) noted how the disease might lurk in a partially immune population following an epidemic, and recent events in Egypt show that much the same may occur when inactivated vaccines are used. Outbreaks of disease were beginning to occur despite the use of these vaccines and the Government were considering a return to the expensive serum-simultaneous method, but were advised by Edwards to use a goat-adapted strain (Anon., 1946).

Koch and other early workers noted that goats and sheep were sometimes affected with rinderpest, but it is apparently not easy to infect these animals experimentally. Edwards succeeded in doing this in 1926 (Edwards, 1927, 1930 and 1942) by inoculating the goat foetus *in utero;* subsequently direct goat passage and alternate goat-bull passage led to attenuation of the virus for cattle. It was first used in the field without the simultaneous inoculation of serum by James and Stirling (Edwards, 1946). Pfaff (1938a and b) described the development of the goat-virus method of vaccination; one gramme of dried goat-spleen provides enough material to immunize 400 cattle. Immunity is produced within 48 hours and persists for at least two years and probably for life. The vaccine, therefore, can be used at the scene of an outbreak and the cost of production is only four shillings per thousand doses.

Some idea of what this vaccine has meant to animal husbandry in India can be gained from a study of a special number of the *Indian Veterinary Journal* for 1941.[1] The following statement describes the position in many areas before the introduction of goat virus: "Rinderpest is taking a heavy toll of cattle; agricultural operations have come to a standstill. Many ruined ryots are leaving their homes and going to distant places with their few remaining cattle." Now, "instead of bewailing his fate and remaining content with merely offering sacrifices to the village deity . . . the ryot sends a report to the nearest veterinary institution for the protection of his cattle." (Achar, 1941). In most areas rinderpest was responsible for 50 per cent. of the total mortality in cattle and following the use of goat-virus the death-rate from the disease has been reduced ten- to 15-fold during the last ten years. The susceptibility of different strains of cattle to rinderpest virus varies considerably, but except in Madras, where a small dose of serum is given (Nair *et al.*, 1941), the Indian plains cattle tolerate the goat-virus without ill-effect. Buffaloes and most hill cattle have to be given a small dose of serum, but in the N.W. Frontier province serum is not given to hill cattle (Sarwar, 1941). The goat-virus produces a serious reaction in European cattle but has been used widely and successfully in Kenya and other parts of Africa (Daubney, 1937, 1940), and has recently been applied with success for controlling the disease in Egypt (Anon., 1946). It is interesting that the cattle of the Gold Coast, which are not of the zebu type, are highly susceptible to rinderpest. Goat-virus cannot be used alone, and in combination with serum does not give a reliable immunity. Cattle are immunized with a dose of 10 c.c. formalized tissue vaccine and five to seven days later 2 c.c. of bovine virus and 150 c.c. of hyperimmune serum. Every year 50,000 cattle are immunized, a good immunity is produced and the mortality is under 1 per cent. (Stewart, 1946).

The war was responsible for some new developments in the work on rinderpest. The possibility that the disease would be introduced into N. America, either by increasing air travel or enemy action, became alarming in the latter part of 1941. A joint U.S.-Canadian commission was appointed and a team of workers[2] began to study the disease on an island in the lower St. Lawrence river early in 1942.

A strain of virus in the form of dried lung tissue was received from Africa and inoculated into calves (animals 6 to 12 months old). Using a suspension of calf spleen as a source of virus the infection was successfully passaged at three-day intervals on the chorio-allantois of ten-day-old chick-embryos. The optimum temperature for incubating the embryos was 37° to 39° C. The concentration of virus in the chorio-allantois and amniotic membranes compared favourably with that in calf tissues but the embryo and its fluids were non-infective.

Rinderpest virus introduced into either the allantoic or amniotic sacs of ten-day embryonated eggs failed to infect them and virus of direct bovine origin could not be maintained by injection into the yolk sac of seven-day embryonated eggs. Rinderpest virus which had been passaged on the chorio-allantois could, however, be transmitted indefinitely by inoculation into the yolk-sac. The embryos and all parts of the egg became infective 24 to 72 hours after injection and although many infected embryos succumbed the virus had no constant lethal effect on the embryos. It was found that the virus persisted in hatched chicks for as long as five days, but young hatched chicks were resistant to infection.

Twenty or more yolk-sac passages attenuated the virus to such an extent that the disease produced in calves easily escaped detection unless temperatures were taken regularly. Passage on the chorio-allantois did not produce a similar attenuation. Calves injected with the yolk-sac virus were usually immune to an injection of bovine virus within four days and did not transmit the disease to the calves placed in contact with them. After six calf passages, however, the chick-embryo virus again became virulent for the bovine, but it is pointed out that in an emergency animals could be immunized with material from the first calf injected with chick-embryo virus. Virus contained in spleen suspension taken from calves reacting to chick-embryo virus could not be re-established in eggs and it is suggested that this was due to the very small amount of virus produced in the spleen. The method of vaccine production, including a detailed description of the drying technique, is given.

In fairly extensive experiments on the immunizing properties of the avian virus it was found that a dose corresponding to 1/100th c.c. of the original egg fluid or tissue produced immunity. Of 155 calves injected 103 developed a temperature over 104° and 32 failed to do this, but they were all immune to a subsequent inoculation of bovine virus.[3] The temperature reaction occurred three to ten days following vaccination. Animals of any age or any period of pregnancy could be vaccinated and the dried vaccine maintained its potency for 15 months when stored at 2 to 5° C. but did not remain potent for long periods at atmospheric temperatures. Reconstituted vaccine rapidly lost its potency.

It was confirmed that immunity could be produced in calves by tissue vaccines inactivated in the presence of chloroform or formalin. The lung, spleen and lymphatic glands were used as a source of virus and the detailed method of production, including the method of grinding the tissues, is described. A single injection of 20 c.c. of the vaccine containing 20 per cent. infective tissue was effective, *i.e.* about 600 doses were obtained from a calf. Similar vaccines prepared from infected eggs and embryo tissues failed to produce any immunity in calves and this was thought to be due to the presence of interfering embryo or egg proteins in the preparations.

Rinderpest infection was established in rabbits by alternate rabbit-calf passage and produced illness in these animals. There was some evidence that the disease could be established in the guinea-pig.

Recovered and vaccinated cattle had neutralizing and complement-fixing antibodies in their serum and evidence is presented indicating that a complement fixation test using egg fluids as antigen would be useful for diagnosis. Of 127 calves vaccinated with avianized vaccine 52 serums were negative to the complement fixation and neutralization tests and these animals proved to be susceptible to bovine virus.

Neutralization tests were also carried out in rabbits, and it was found that an indication of the antigenic potency of a vaccine could be obtained by the amount of immunizing antibodies produced in the serum of vaccinated calves, as demonstrated by the ability of the serum to prevent a thermal reaction in rabbits injected with the rabbit passage virus. In a further development of this technique young chicks were injected with avianized vaccines and their serum tested for immunizing antibodies in the rabbit.

Rinderpest virus has previously been established in rabbits and the outstanding result of the foregoing work is obviously the adaptation of the rinderpest virus in the chick-embryo. There seems little doubt that the attenuated strain of virus used by the U.S. and Canadian workers would be the most suitable vaccine for immunizing European cattle. Whether it will replace the goat-virus for the much more important purpose of immunizing tropical cattle remains to be seen. It is possible that in these animals the fully attenuated chick-embryo virus may leave some non-immune animals due to the "blocking out" of any reaction similar to that which

[1] *Indian Veterinary Journal*, 17. No. 4. 201-251.

[2] The following workers were engaged in the research which is published in a series of papers in the *Amer. J. vet. Res.* 7. No. 23. 133-228:—James A. Baker, H. K. Cooper, A. S. Greig, Henry J. Griffiths, M. W. Hale, Dubois L. Jenkins, Fred D. Maurer, Thomas O. Robey, Richard E. Shope, James Terrence, R. V. L. Walker.

[3] On another page it is stated that 32 of the calves injected with egg passage virus were susceptible to bovine virus.

sometimes occurs when goat virus is used on animals previously injected with inactivated vaccines.

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REPORT

[Civil Veterinary Department, Assam: Summary of the Annual Report for the year 1944-45.]

This short summary leaves rather much to the imagination. Rinderpest and contagious pleuro-pneumonia appeared to be the major cattle epizootics though under research schemes some 13 diseases of horses and ruminants and several poultry diseases were receiving attention. Control measures in dealing with epizootics appeared to be badly handicapped by lack of any suitable regulations to enforce quarantine or prophylactic measures and also by lack of co-operation, from ignorance, on the part of the stock-owners. The appointment of additional staff for propaganda and education and the introduction of control legislation was deemed an urgent necessity. Prophylactic inoculations carried out by field staff numbered 209,852. Scientific and research work was carried out by a V.I.O. and an Assistant V.I.O. (poultry).

S. A. E.

"YOUNG HORSES SENT TO THE KNACKERS"

At a recent meeting of the Cornwall Agricultural Committee, Mr. G. P. Williams, chairman of the Livestock Committee, reported (says *The Farmer & Stock-Breeder*) that there were three heavy horse societies operating in the county, but the number of mares served during the past season showed a considerable decrease on the previous year. Recent statistics of mares served were: 457 in 1943, 362 in 1944, 212 in 1945, and 115 in 1946. That big decrease would in a few years create a difficult position. Something ought to be done to arrest the decline.

Mr. Harry Ould was concerned about the number of young horses which had never been worked being sent to the knackers' yards for slaughter. It seemed a strange policy that they should spend money to encourage horse breeding in the county and then find that horses from two to four years old were being sent for slaughter. He suggested that the Ministry should be asked to prohibit the slaughter of young horses.

Mr. Graham White said they had to face the fact that they were living in days of mechanization and that there was not the same demand for heavy horses.

THE VETERINARY RECORD

NOVEMBER 16TH, 1946

CATTLE PLAGUE

WE publish in this issue a brief description of the stages in the control of cattle plague, or rinderpest. The disease was shown to be infectious in 1711. Three years later slaughter and quarantine measures were successfully applied in Great Britain but their value was quickly forgotten in the superstitious atmosphere of that period, and it was not until the Contagious Diseases (Animals) Act of 1869 was passed that adequate powers to control the disease were given to the Veterinary Department of the Privy Council. Indeed, it may be said that cattle plague was largely responsible for the creation of the veterinary colleges and the development of veterinary preventive medicine.

The use of serum, or the serum-simultaneous method of vaccination, which were both developed at the close of the last century, provided a big step forward in those countries where the disease is enzootic and the slaughter policy cannot be applied. It was the development of a goat-attenuated strain by J. T. Edwards from 1926-1930, however, which led to the most far-reaching progress in the control of the disease, because of the cheapness and efficiency of the vaccine it provided.

Recently a group of U.S. and Canadian investigators have published work describing the adaption of the rinderpest virus to the chick-embryo and its subsequent attenuation in that host. Workers throughout the tropics will be the first to congratulate them on this achievement, but their papers would have been greatly enhanced if they had displayed more knowledge of the immense amount of work which has been done on rinderpest. The work is presented in such a way that the uninformed reader would imagine that the egg-adapted virus is the first attenuated strain available for vaccinating cattle—no mention is made of Edwards' goat adapted strain in this connection although it has revolutionized the control of rinderpest over vast areas of the tropics. This is the more surprising as a "caprine strain" is mentioned in the American papers.

Because the egg strain is more attenuated than the goat strain, it may not be sufficiently virulent to produce infection regularly in relatively resistant tropical cattle and so may leave a proportion without immunity. Its value will need to be confirmed, therefore, by full-scale field trials in countries where the disease is enzootic. It is likely, however, that it will prove more suitable than the goat strain for vaccinating European cattle should the need for such procedure arise.

In a foreword introducing the American work it is stated that the avianized virus has proved to be so attenuated that only mild and negligible reactions are produced in native cattle which are more highly susceptible to the disease than European breeds. This statement is difficult to understand. The words "native cattle" presumably apply to those in the tropics, the great bulk being of the zebu type which is well recognized to be more, *not less*, resistant to rinderpest than the European type of cattle.

GRANT FOR AGRICULTURAL COLLEGES

In a recent statement in Parliament Mr. Tom Williams, Minister of Agriculture, stated that £18,850 was contributed by the Exchequer to four agricultural colleges not directly associated with a university for the academic year 1945-46. The colleges concerned were the Royal Agricultural College (Cirencester), Studley College, Seale-Hayne Agricultural College and Harper Adams Agricultural College.

CLINICAL COMMUNICATION

Hypoglycaemia in a Pregnant Ewe

M. W. S. HITCHCOCK and A. T. PHILLIPSON

Unit of Animal Physiology, Cambridge

We have studied the concentration of glucose in the venous blood of a pregnant Welsh ewe which showed symptoms similar to those described for pregnancy toxaemia and we are recording this case as it emphasizes, in a dramatic manner, the fact that sheep can tolerate a concentration of glucose in the blood far below that usually considered necessary for life.

The method used for estimating glucose in blood was Somogy's copper reduction following precipitation of the protein by calcium sulphate and sodium hydroxide. We have tested this method critically and found that it gives true values for glucose, as confirmed by yeast fermentation, and not total reducing substances.

The case record of the ewe in question was as follows:—

February 11th.—Ewe was brought from the field to a pen in the animal house of the laboratory when it was 126 days pregnant. The sheep did not feed well.

February 18th.—The first signs of abnormality appeared. The sheep remained down and was not inclined to move or feed.

February 19th.—The sheep was still in the same condition as it was on the 18th. When roused to her feet she was weak and walked with a swaying gait. The head was held high, the front incisors were showing and muscular tremors were noticed in the lips and along the muscles of the back. Blood drawn from the jugular vein contained 18 mg. per cent. glucose. At midday she was given 67 g. glucose as a 10 per cent. solution subcutaneously. Blood drawn from the jugular vein within a few minutes after the injection contained 163 mg. per cent. glucose. Further samples at 2.30 and 5.30 p.m. contained 75 and 123 mg. per cent. glucose. The sheep was normal in the afternoon.

February 20th.—The sheep was a little dull but otherwise showed no symptoms. Blood glucose was 5 mg. per cent. at 9.30 a.m. and 24 mg. per cent. at 2.30 p.m.

February 21st.—The sheep was observed to be eating freely and appeared normal. Blood glucose was less than 5 mg. per cent. at 9.45 a.m.

February 22nd.—Sheep normal. Blood glucose was 9 mg. per cent. at 9.30 a.m.

February 25th.—Sheep normal. Blood sugar was 23 mg. per cent. The sheep was moved to another pen and an attempt was made to reproduce the syndrome, previously observed, by withholding food. After 48 hours, the same symptoms were observed in a mild form, but these disappeared when the sheep had been moved about the pen. The concentration of glucose in the blood was 14 mg. per cent. Food was given and the animal ate sparingly; the blood glucose rose to 19 mg. per cent. at midday, but later the concentration fell to 14 mg. per cent. It remained in this region until March 4th, when the ewe was found to have lambed overnight. The lamb, which was dead when first seen, weighed 2,962 g.; it was born alive since the lungs had been inflated. The concentration of glucose in the blood of the ewe was 33 mg. per cent., 40 mg. per cent. and 43 mg. per cent. on March 4th, 5th and 6th respectively.

The ewe was slaughtered about two months later and was found to have a heavy infestation of liver fluke, but even so this case is interesting for two reasons. It shows firstly that the concentration of glucose in the blood is not in itself the sole factor concerned with the symptoms observed, for (1) the concentration was 18 mg. per cent. when the syndrome first appeared, (2) the sheep was normal on three mornings when the concentration was well below 10 mg. per cent., and (3) the return of symptoms occurred when the concentration was 14 mg. per cent.; and secondly that the presence of a foetus is a factor concerned with the low concentration of blood glucose, for the latter rose to the normal level immediately the ewe lambed.

*

At the weekly sale at Sedbergh an attested Dairy Shorthorn cow belonging to Messrs. A. and E. Chapman, of Middleton, near Kirkby Lonsdale, realized the market record price of £152, paid by J. G. Bellas, Newby, Penrith.

* * * * *

The Minister of Agriculture has appointed Mr. Peter Sutcliffe as an additional member of the Central Advisory Committee on Artificial Insemination. With Mr. John Edgar, he will represent bodies other than the Milk Marketing Board, operating cattle breeding centres.

Persistent Pupillary Membrane in the Dog*

ALAN G. WARREN

Royal Veterinary College, London

Subject.—Eleven months old wire-haired terrier dog.

History.—The animal had been under treatment for distemper and was convalescing when this condition was diagnosed.

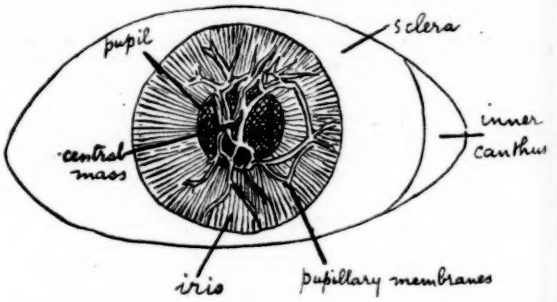
Signs.—On inspection of the eye one noticed a number of strands passing across the pupil and uniting together in the form of a mass in the middle of the pupil. On further examination the strands were found to be pigmented the same as the iris. The point of union, however, was white. The strands appeared to be joined to the anterior surface of the iris.

The condition did not appear to embarrass the vision of the eye and no treatment was advised or given.

A suggested line of treatment is to incise the cornea under anaesthesia, to grasp the central blob with iris forceps, and to withdraw it and remove with scissors, in a similar way to performing iridectomy.

In early foetal life there is a fibro-vascular mass filling the pupil. In later foetal life this is resorbed, but in isolated cases, such as this, it remains.

The condition must be differentiated from posterior synechia due to iritis. In this case the strands come from the pupillary margin whereas in persistent pupillary membrane they come from the anterior surface of the iris. In either case there may be adhesion to the anterior surface of the lens.



* Case seen in vacation pupilage with Mr. P. W. Bloye, M.R.C.V.S., Plymouth.

MAN'S ANCESTRY IN AFRICA

"Further details of the circumstances and character of the recently announced discovery of relics of two early forms of extinct anthropoids have now been recorded by Dr. L. S. B. Leakey (*The Times*, August 23rd)," states *Nature* in a recent issue and continues: "Two lower jaws were found within 15 ft. of one another by Dr. Leakey, while on leave from war-time duties, in the Lower Miocene deposits of Rusinga Island which lies at the mouth of Kavirondo Bay in the north-east corner of Victoria Nyanza. Of these two specimens, one has since been identified as belonging to the genus *Proconsul*, the other as belonging to the genus *Xanopithecus*. These two genera with a third, *Limnopithecus*, were first discovered and described by Dr. A. T. Hopwood in 1931 when working as a member of the 'Third Leakey East African Archaeological Expedition' on the Lower Miocene deposits at Koru in Kenya. Further discoveries of fossil ape material were made by Dr. Leakey and other members of his expedition at Rusinga and elsewhere between 1931 and 1935. Dr. Hopwood regarded *Proconsul* as a very close relative of the chimpanzee, and *Limnopithecus* as being of the same stock as the gibbons. When the new specimens now recorded by Dr. Leakey had been cleaned and examined it was found that the *Proconsul* jaw, which is very nearly complete and the most nearly perfect of any fossil anthropoid jaw yet discovered, did not show so close a relationship to the chimpanzees as Dr. Hopwood had thought. It was, in fact, much more human in certain characters than not only the chimpanzee jaw but also that of the Piltdown skull. The chin is more vertical, there is no simian shelf (the ledge of bone on the anterior aspect of the symphysial area of the jaws of all apes) and the condyle in many ways is more like that of a man than an ape. Of possible alternatives, Dr. Leakey favours the view that in *Proconsol* we have a near approach to an ape-like form from which the human stem eventually was evolved, and goes on to suggest that notwithstanding recent tendencies to look to Asia, Africa may well be the place of origin of man."

ABSTRACTS

[Criteria of Pathogenicity in Staphylococci. Christie, R., North, E. A., & Parkin, B. J. (1946.) *Austr. J. exp. Biol. Med.* **24.** 73-78.]

The usual criteria of pathogenicity of staphylococci include the ability to produce coagulase, toxin, haemolysin, fibrinolysin and pigment, and the ability to split mannitol. On the basis of the coagulase test and the haemolysis of sheep red blood cells, staphylococci can be grouped broadly into three classes, *viz.*, coagulase-positive strains of definite pathogenicity, coagulase-positive strains of doubtful pathogenicity, and non-pathogenic strains.

The authors carried out experiments to correlate the foregoing criteria of pathogenicity with pathogenicity of the strains for mice. They found that the strains which killed mice were those which produced α toxin—a substance which is fatal to both animals and man—and these strains, too, were those which appeared to be of primary pathogenic importance clinically. Some strains failed to produce β toxin, and yet were pathogenic.

Coagulase production is a good indication of pathogenicity, but some strains may produce coagulase and still be non-pathogenic. With animal strains, it was found necessary to test against human, ox, sheep and horse plasma, before deciding whether the strain was coagulase-positive or not.

The majority of the pathogenic strains (78 out of 90) failed to produce fibrinolysin, and the majority of the human pathogens (637 out of 671) were fibrinolytic. The difference is so marked as to suggest that some strains of staphylococci are specific for man and some for animals.

Fermentation of mannitol agrees fairly well with coagulase production, but the agreement is less marked with strains of animal origin than with those of human origin.

Pigment production has little value as an indicator of pathogenicity, but strains which rapidly produce much pigment are probably pathogenic.

I. W. J.

* * * * *

[A Transmissible Gastro-enteritis in Pigs. Doyle, L. P., & Hutchings, L. M. (1946.) *J. Amer. vet. med. Ass.* **108.** 257-259.]

For several years outbreaks of this disease have been observed. Pigs of all ages are susceptible in varying degrees, the disease being more severe and more often fatal in piglets of from one day to three weeks old than in any other age group. Though readily contagious, sporadic outbreaks are frequent. Scouring and vomiting are the characteristic symptoms, the latter being more common in breeding sows which, however, only seem to be affected when suckling, and generally recover. In store pigs, mortality is not so high as in piglets, most animals recovering, though loss of weight is very considerable.

On *post-mortem* examination, gastritis and enteritis are commonly, though not always, observed. When present the lesions are confined to the mucosa as a rule, but can easily be seen through the serous surface. The mesenteric vessels are frequently engorged, the kidneys degenerative and enclosing deposits of urates and almost invariably a large amount of white, yellow or green fluid distends the intestine.

Apart from slight degenerative changes in the kidney and mesenteric lymphatic glands, histological changes are absent.

The contagious nature of the disease was confirmed experimentally by contact, direct feeding of macerated intestines, contents and small amounts of bacteria-free filtrates. A naturally infected pig placed in a pen with a sow and eight one-day-old piglets, produced illness in two piglets at the end of 24 hours. At the 48th hour, diarrhoea, vomiting and loss of weight developed in most of the litter, and three died during the third day. By the end of five days all the litter were dead, but the sow which had displayed all the symptoms had recovered and was normal again. The feeding of gastro-intestinal contents to another sow and litter resulted in a similar chain of events. When 0·5 c.c. of a filtrate was fed infection was less certain, and losses amounted to 50 per cent. as against 95 per cent. by feeding whole contents. The infective agent will resist freezing for 70 days, is distinct from the swine fever virus and did not affect a one-day-old calf exposed to infection. Penicillin and sulphathalidine were both ineffective in bringing about a cure.

N. S. B.

Weekly Wisdom

It is not fanciful to see in the wealth and splendour and resounding depths of English an ocean out of which the thoughts of freedom flow.—Eric Linklater (Rectorial Address at Aberdeen University).

Questions and Answers

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Treatment for Anoestrus in the Mare

Q. CLXIX.—*What Treatment is suggested for Anoestrus in the Mare?*

A.—This question was largely answered on October 7th, 1944, under the heading "Cystic Ovaries in the Mare," when it was made clear that the condition of the ovary at any given time is an expression of pituitary stimulation. This point should be borne in mind and also the fact that the oestrus cycle is built up of many interacting factors so that, in anoestrus, stimulation applied to any of the tissues involved may set the cycle in motion again. The removal of simple contributory causes such as unsuitable feeding, exposure, heavy milking and overwork may be sufficient to permit normal hormone production and response.

A mare failing to come into oestrus at the proper season should be carefully examined *per rectum* to determine that she is not already in foal. Satisfied on this point, the operator should locate and manipulate the ovaries to detect the presence of follicles. This manipulation is itself a stimulant to ovarian function. If no follicles are detected an injection of pregnant mare serum (1500 to 2000 units) will stimulate their production. If a large follicle is found a normal oestrus cycle will usually be restored if the follicle is ruptured (a trocar is usually necessary). Small follicles may be stimulated to ovulate by the injection of large doses of luteinizing hormone, preferably intravenously.

Further examinations may be necessary at intervals of ten days to check the result of any treatment applied until the mare comes in season. She should then be covered even though there does not appear to be a follicle ready to ovulate and the service should be repeated every three days until oestrum ends. If the oestrum turns out to be of the extended type and the mare does not conceive, the fact that the oestrus cycle has recommenced should be sufficient cause for satisfaction as normal follicle development is almost certain to occur at a subsequent oestrum.

. . . . .

Rectifying Suspected Deficiencies in the Dietary of Brood Mares and Foals

Q. CLXX.—1. *In the case of brood mares and foals fed on a diet where the hay and pasture is suspect of being deficient in calcium, phosphorus and iodine, please indicate what drugs, and the dosage of same, should be added to the food. I have been giving small doses of pot. iod. with syr. calc. lact. phos. This combination is probably correct. But I do not know the dosage of the latter, and you may be able to suggest a cheaper source of calcium and phosphorus. If not, please indicate the dosage.*

2. *In bloodstock, it is a common practice to give aqua calcis either alone or with ol. lini. Please state if the calcium supplied in this way is of any use, or what proportion of it is absorbed by the animal.*

3. *In the case of animals indicated, what value would you place on separated milk (T.T.) as an addition to the food?*

A.—The value of feeding bone flour in cases of mineral deficiency is confirmed by the behaviour of affected cattle and horses which draw attention to their condition by gnawing the bones of the skeletons commonly seen in deficiency areas in the tropics.

Sterilized bone flour is cheap, readily obtained and freely eaten by stock. Being harmless if fed in excess of actual requirements the precise percentage absorbed is not of practical importance. Dosage of from ½ oz. daily for foals up to 2 oz. for mares in foal and milking will fill any gaps in the calcium and phosphorus content of a slightly deficient diet.

Separated milk has the additional advantages of being freely absorbed and is physiologically completely available but it is expensive and, at present, unobtainable in most districts.

Lime water is of some value but supplies no phosphorus or trace elements.

In this country of grey skies the addition to the diet of cod liver oil or halibut liver oil is important as mineral metabolism is inhibited if there is a vitamin D deficiency.

An iodine deficiency is less easy to determine and more dangerous to overcome. If iodine deficiency is considered to be present the animals' minute requirements would be met by feeding ½ to 1 oz. of blood meal daily.

Private Tuberculin Test on Animals for Sale

Q. CLXXI.—*When carrying out a private tuberculin test on animals for sale is one justified in using both avian and bovine tuberculins and if so, how should the test be interpreted?*

A.—The type of tuberculin test to be used for private testing of individual animals for sale is one presenting some difficulty to the veterinary practitioner. The "comparative test" is essentially a herd test, requiring for its interpretation an over-all picture of the reactions to both tuberculins throughout the herd, and is of only very limited value in single animals. Where both reactions are positive, but the avian markedly more so than the mammalian, one may be justified in passing an animal, but where positive reactions are of approximately equal extent it is very difficult to interpret results without a "herd picture." If the veterinarian does a lot of testing (private) in a self-contained herd, he may be helped in his decision.

It should be borne in mind that purchasers of animals which have passed one test usually acquire them (*a*) to add to designated herds, or (*b*) to use as house cows. In either case, *the test is carried out for the protection of the purchaser.*. This point must be emphasized by the practitioner although the vendor be his client.

Under these circumstances it is generally advisable to use only mammalian tuberculin in private tests, although this may mean refusing certificates to some animals which are perfectly sound.

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Shock Development Factors

Sir,—Twice recently histamine has been mentioned in *The Veterinary Record* as the chief development factor in shock. Mr. G. O. Davies[1], discussing anaphylaxis, said, "It is to the histamine released in this way that the symptoms are due." In a recent "Q. and A." column a questioner assumes that many cases of shock are due to histamine release. The answer gives no caution on this dangerous assumption and one might imagine that the author of the answer was inclined to agree.

Parsons & Phemister[2] found that limb trauma caused a fall in blood pressure with marked decrease in erythrocyte count although Dale and Richards had found an increase in erythrocytes in histamine poisoning. They found further, that blood from a traumatized limb, when perfused through the limb of a second dog, caused no fall of blood pressure or vaso-dilation.

Aird & Henderson[3] collected, in rubber balloons, the peritoneal transudate from the strangulated intestines of cats. From the maximum amount of fluid so collected they recovered 4 mgm. of histamine. Dale[4] has shown that 10 mgm. per kg. body weight may be injected into unanaesthetized cats without ill effect, over a period of 15 minutes.

Maycock[5] carried out similar but more complicated experiments and concluded that histamine played little or no part in death from strangulation of the intestine, and that strangulation caused no increase in the susceptibility to histamine.

O'Shaughnessy & Slome[6] found that, with complete venous occlusion, trauma to the limb caused the same fall of blood pressure as without occlusion. Histamine, injected into the vein of an occluded limb, caused no fall of blood pressure.

Slome[7] studying shock from muscle trauma and its relation to histamine found that "the amount of these substances necessary to produce shock in an animal could only be obtained by the careful extraction of a mass of muscle greater than the entire weight of the animal."

I offer the above to suggest that the role of "toxic metabolite," be it histamine or another substance, is not established one way or the other. That being so, we can take a wider view of the shock problem.

To the surgeon, the prevention of shock is not second in importance to the prevention of sepsis. In planning surgical treatment, every possible shock development factor must be eliminated. May I suggest that the more important shock development factors are probably:—

1. Haemorrhage.
2. Toxic metabolites from tissue trauma.
3. Local fluid loss from tissue trauma and obstructed venous return.
4. Summation of repeated nociceptive nervous stimuli, whether the patient is anaesthetized or not.

The fourth factor may appear old-fashioned, but I can find little excuse for continuing anoci-association technique and none for causing unnecessary trauma, which would have been painful had the patient not been anaesthetized.

Surely established shock could be treated on more rational lines than those suggested in the answer. All workers seem to agree that the ultimate situation in shock is an increase in permeability of the capillary membrane, with a loss of plasma fluid into the interstitial spaces. The electrolyte patterns of the plasma and interstitial fluids are identical, but the plasma protein is considerable while the protein content of the interstitial fluid is very small, if, indeed, it exists at all[8]. The presence of this plasma protein gives to the blood an osmotic pressure which is greater than that of the interstitial fluid, the difference being approximately equal to the hydrostatic pressure in the capillaries.

The logical treatment of shock is then replacement therapy with iso-tonic plasma or partial replacement with hypertonic plasma. The advantage of the latter procedure is to bring the osmural concentration of the blood above normal and to complete the replacement by reabsorption from the interstitial fluid.

I have repeatedly asked commercial firms to prepare dry plasma, but have always been told that they cannot do so as there is no demand. The problems of drying animal plasma should be simpler than in the human case. Russian workers have found that cadaver blood is preferable to that from the live donor[9] but it is not used in this country on ethical grounds. It should be a simple matter to collect blood from animals which have been slaughtered or destroyed. The use of dry plasma would save many animal lives and make possible many operations on cases which are, at present, hopeless.

Yours faithfully,

228, High Street, Berkhamsted. A. C. Dixon.
October 21st, 1946.

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(2) Parsons m Phemister. (1930.) *Surg. Gynec. Obtet.* 196.
(3) Aird & Henderson. (1937.) *Brit. J. Surg.* 24. 773.
(4) Dale. (1920.) *J. exp. Path.* 1. 103.
(5) Maycock. (1938.) *Brit. J. Surg.* 25. 677.
(6) O'Shaugnessy & Slome. (1935.) *Brit. J. Surg.* 22. 589.
(7) Slome. *Proc. roy. Soc. Med.* 28. 1479.
(8) Peters, J. P. "Body water and the exchange of fluids in man."
(9) Mudd, S., & Thalhimer, W. "Blood substitutes and blood transfusion."

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Hormonal Prevention of Oestrus (Q. CLXIV)

Sir,—In view of the lengthy and irrelevant comments of your correspondent, in *The Veterinary Record* of October 19th, on my criticism of his answer to a query on the "suppression of oestrus," and of the fact that he enjoys the privilege of anonymity in making these comments, may I be allowed space in your correspondence columns to defend my statements.

It is abundantly clear that your respondent has become a victim of his own careless use and interpretation of physiological terms regardless of their accepted meaning. I need only refer to his naive definition of "oestrus" where he uses the term to mean the whole sex cycle as well as a phase in that cycle. May I remind him that the classical and accepted definition of "oestrus" is that given by Heape: "Oestrus is the special period of desire in the female; it is during oestrus, and only at that time, that the female is willing to receive the male, and fruitful coition rendered possible in most, if not in all, mammals."

That the sex *cycles* of the lower animals, primates and women, are fundamentally similar, I most certainly did not, and do not, deny; thus your respondent's quotations (Nos. 1, 2, 3) in support of this similarity are superfluous. What I did question was the relation between certain specific *phases* of the oestrous cycle and of the menstrual cycle. Your respondent apparently assumed that the phase of oestrus in the sex cycle of the lower animals was analogous to the menstrual phase of oestrus in the sex cycle of the human and implied that since a hormone would suppress the menstrual phase it could logically be expected to suppress the oestrous phase. I would beg your respondent, since he appears to relish quotations, to ponder over the following verdict given by that world authority on the endocrinology of the sex cycle, Edgar Allen, and his two eminent colleagues, Hisaw & Gardner (1939) on the relation of the phases in question: *"Therefore, menstruation is at the opposite phase of the cycle from estrus. It is not analogous to the proestrous bleeding in the dog or cow nor the slight bleeding of primates at midpoint between menstrual periods."* Your respondent, I think, could hardly ask for a more authoritative, pointed and precise statement in support of my argument. He will also note that the above verdict disposes of his irrelevant quotation (No. 4) on mid-interval bleeding and in addition covers the question of pro-oestrous bleeding in the bitch.

Had your respondent read my letter with more care he would have saved himself the trouble of giving quotations Nos. 5 and 6. They merely support my statement, in the second paragraph of my first letter, to the effect that large doses of oestrogen suppress the normal functioning of the ovary.

Having now disposed of your respondent's anthology of quotations from endocrinological literature, may I again stress the crux of the problem. Is it possible, as your respondent suggested, to suppress oestrus in bitches by large doses of oestrogen without producing oestrous symptoms due to the pharmacological action of the injected oestrogen? This last proviso, in view of my experience with the use of the hormone in the cow, I considered important and one that ought to be brought to the notice of the questioner. I can hardly imagine that the owner of a bitch would gain satisfaction

from his veterinarian's explanation that the oestrous behaviour of his bitch was not now due to the endogenous oestrogens from the animal's ovaries but only to the agent used to suppress ovarian activity.

It may well be that your respondent's therapy is effective notwithstanding the inaccuracy of his analogies and statements. Information on its efficacy can only be gained from actual trial of the therapy, and I sincerely hope that practitioners who have employed oestrogens for this purpose will report their findings.

Sales figures, whether confidential or otherwise, can scarcely be regarded as scientific proof of the efficacy of a drug. Moreover, I find no reference to such a use for oestrogens in the recent catalogues of several of the leading manufacturers of hormone preparations, which is odd if their use for the purpose in question is as common and satisfactory as your respondent would imply.

I understand that large doses of oestrogens are employed in cases of misalliance in bitches. It would be of interest to learn whether in such cases the drug has any effect on the duration of oestrus. I observe one manufacturer gives the warning that oestrus may be considerably prolonged.

I apologize to your respondent for my incorrect assumption that he coined the term "to oestruate," nevertheless I still hold it to be an ugly and misleading word and one which has little or no currency in modern endocrinological literature.

Yours faithfully,

Alfred T. Cowie.

The National Institute for Research in Dairying,
Shinfield, Nr. Reading.
October 23rd, 1946.

Reference

Allen, E., Hisaw, F. L., & Gardner, W. U. (1939.) Sex and internal secretions. London: Baillière, Tindall & Cox. Chap. VIII, page 521.

QUESTIONS IN PARLIAMENT

County Agricultural Executive Committees (Activities)

Major Legge-Bourke asked the Minister of Agriculture how many different categories of areas administered by county A.E.C.s there are; what are these categories; how great a percentage of total acreage of each area decides the classification. and if the chairman and chief executive officers of each area are specialists in the relevant categories, naming the areas where there are exceptions.

Mr. T. Williams: I assume that the hon. and gallant Member has in mind the general nature of the farming activities carried on in each of the 62 administrative areas for which there are county war agricultural executive committees. Owing to the wide variety of crops and stock and even of farming systems within any particular county, classification into categories would be either impracticable or unprofitable. The chairmen of war agricultural executive committees are chosen for other capacities than that of specialized knowledge of local systems of farming or horticulture. The staff of each committee, however, includes officers of the National Agricultural Advisory Service with an expert knowledge of the main farming or horticultural activities in the county.

In all but a few counties the executive officers are also county advisory officers of the N.A.A.S., and in those counties which are recognized as predominantly horticultural, expert horticultural advisers of the N.A.A.S. are being appointed as executive officers as opportunity offers.

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Price Review (Agriculture)

Mr. Granville asked the Minister of Agriculture what progress has been made towards the completion of a satisfactory price-fixing arrangement upon a fair and equitable basis for agriculture.

Mr. T. Williams: A number of meetings have been held between representatives of the Agricultural Departments and of the Farmers' Unions of England and Wales, Scotland and Northern Ireland, at which useful progress has been made in considering possible improvements in the price review. I hope to be in a position to make an announcement shortly.

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Rheumatic Diseases (Research)

Mr. Sutcliffe asked the Lord President of the Council the estimated expenditure in Great Britain at the present time on research into the chronic rheumatic diseases; what proportion of this work is fostered by the Medical Research Council; and whether any increase or acceleration of such research can be achieved in the near future.

The Lord President of the Council (Mr. Herbert Morrison): I have no figures of expenditure from private sources such as the Empire Rheumatism Council and the Nuffield Foundation. Expenditure by the Medical Research Council directly on this problem is estimated at £3,500 per annum at the present moment, but the figure is subject to considerable fluctuation as new lines of approach to the subject are opened up. It also takes no account of fundamental research of a more general kind which may indirectly throw light upon the problem.

Mr. Sutcliffe: Is the right hon. Gentleman aware that there is no type of disease in connection with which further research is more urgently needed just now, and is not the contribution by the Medical Research Council altogether insignificant?

Mr. Morrison: No, Sir, I do not agree. There is plenty of research being done otherwise, and the mere amount of money spent is not necessarily a guide to success. I have a feeling that probably the solution to this problem will be found some day by a sheer fluke when somebody is looking at something else which has nothing whatever to do with this particular problem.

Sir W. Wakefield: Could the right hon. Gentleman arrange for greater publicity to be given to the very valuable work done by the Medical Research Council? A good deal of ignorance of some of this work could be dispelled by such publicity.

Mr. Morrison: I am obliged to the hon. Gentleman, and I think there is a lot in what he says, but it is very difficult to train scientists to adopt a proper and appropriate sense of publicity. I expect they get a bit frightened by the Opposition who object to any sort of publicity about anything.

Mr. Eden: Could not the Government lend them one of their numerous public relations officers?

Mr. Morrison: Perhaps the right hon. Gentleman recalls that this Government has not got so many at its disposal as the Government of which he and I were Members.

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Patent Medicines

Mr. Parker asked the Minister of Health whether he will introduce legislation to deal with patent medicine abuses.

Mr. Key: While my right hon. Friend is in sympathy with the objects which my hon. Friend has in view, I am afraid that he can hold out no hope of legislation at present.

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Vivisection

Mr. Viant asked the Secretary of State for the Home Department how many places were registered under the Cruelty to Animals Act, 1876, for experiments on living animals during 1945.

Mr. Ede: The total number of places on the register at any time during 1945 was 449.

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Stock Poisoning by War Stores

Mr. Snadden asked the Secretary of State for War the number of claims in the counties of Perth and Stirling for compensation for the poisoning of cattle or other livestock by poison gas or other war-like stores; the numbers of cattle, sheep, poultry and horses involved; the number of dairy herds destroyed; and the total amount of compensation claimed to date.

Mr. Bellenger: Eighty claims have been received involving 2,438 cattle (including seven dairy herds destroyed), 11,527 sheep, 15 horses and 445 poultry. Investigation showed that 350 of the poultry for which claims were intimated were not involved in any possibility of poisoning from warlike stores. The remaining cases are still being investigated. The total compensation so far claimed is £92,880.

Mr. Snadden asked the Secretary of State for War what steps are being taken to prevent the continued contamination of pasturage and crops by poison gas, or other emanation, from the explosives and ammunition stored in the counties of Perth and Stirling; how many additional cases have been notified since June 25th, 1946, and where they are situated.

Mr. Bellenger: No burning of any ammunition stores of the kind referred to has been carried out since February of this year. I understand that grazing and feeding trials have shown that the area is free from contamination. No reports have been received of cases occurring since June 25th.

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Animals (Sea Transport)

Mr. Peter Freeman asked the Minister of Agriculture whether, in view of the large increase in the number of live animals selected to be imported into this country in the immediate future, adequate steps are being taken to ensure that no unnecessary cruelty or suffering is permitted on the long sea voyages involved.

Mr. T. Williams: The Animals (Sea Transport) Order of 1930 provides for the protection of ruminating animals and swine carried by sea to this country. Those captive animals which may be outside the scope of this Order are usually brought here under expert supervision, and I am not aware that it is the case that any unnecessary cruelty or suffering is caused to them during the sea passage.

NOTES AND NEWS

Diary of Events

Nov. 20th.—Meeting of the Midland Counties Division, N.V.M.A., at Birmingham (Corporation Veterinary Department, Holliday Street), 2.30 p.m.

Nov. 22nd.—Meeting of the Veterinary State Medicine Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 11.15 a.m.

Nov. 22nd.—Scientific Meeting of the Institute for the Study of Animal Behaviour, Regent's Park, N.W.8, 4 p.m.

Nov. 22nd.—Meeting of the Sussex Division, N.V.M.A., at Brighton (The Old Ship Hotel), 2.30 p.m.

Nov. 22nd.—Annual Meeting of the North Wales Division, N.V.M.A., at Llangollen (Royal Hotel), 2 p.m.

Nov. 29th.—Meeting of the Royal Counties Division, N.V.M.A., at Reading (Caversham Bridge Hotel), 2.30 p.m.

Dec. 3rd and 4th.—R.C.V.S. Written Examinations begin.

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New Appointments to the Staff of the Ministry of Agriculture

As notified in recent issues, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the status and salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may, nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

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PERSONAL

Births.—BATEMAN.—On November 7th, 1946, at the Phyllis Memorial Nursing Home, Melton, Suffolk, to Doreen (*née* Fawbert) and H. Norman Bateman, MS.R.C.V.S.—a son, William Norman Brendan.

BOWEN.—On November 4th, 1946, to Joan, wife of P. D. G. Bowen, M.R.C.V.S., Littlehampton—a daughter.

ROBERTS.—On October 31st, 1946, at the County Hospital, Bangor, to Blodwen (*née* Jones), wife of Hywel R. Roberts, M.R.C.V.S., of Islwyn, Fourcrosses, Chwiloy, Caerns.—a daughter.

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Marriages.—GARDNER—TULEY.—The marriage took place on October 26th, 1946, at Christ Church, Swindon, of Brian Labbett Gardner, M.R.C.V.S., of 51, Bath Road, Swindon, and Gwendoline Joan Tuley, of 2, Broome Manor Road, Swindon.

POMPHREY—DONALDSON.—On November 6th, 1946, at the Methodist Church, Glasgow, A. M. Pomphrey, M.R.C.V.S., of Lochgilphead, Argyllshire, to May Donaldson, of Glasgow.

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Forthcoming Marriage.—SHAW—PATCHETT.—The engagement is announced between Josiah A. Shaw, younger son of Mr. and Mrs. A. Shaw, of Edge Lane, Chorlton-cum-Hardy, Manchester, and E. Hilda Patchett, B.V.SC., M.R.C.V.S., only daughter of Mr. and Mrs. J. Langton Patchett, of Wilbraham Road, Chorlton-cum-Hardy, Manchester.

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The Late W. J. Ironside, M.R.C.V.S., M.P.S.

(*Contributed.*)

By the sudden death of William James Ironside ("Bill"), recorded in your last issue, there has passed from us one who will long be remembered by many friends.

A true Scot, he was of the type who could be represented as "a man of forbidding aspect, stern and unbending!" and yet only a little study of his life would show at once that he was a man of wide sympathies and much humour.

It was Thomas Carlyle who said of the great John Knox: "Withal, unexpectedly enough, this Knox has a vein of drollery in him, which I like much, in combination with his other qualities." Neither was there any doubt about those "other qualities." Neither one sensed in him the steadfastness which was bred in older, sterner days on his native soil. A contemporary of student days relates "How utterly wrong was that early impression of dourness, for presently his stern features would relax and that infectious laugh would follow."

By nature he was totally unassuming; thus was he always modest and quite silent about his own achievements. He readily made friends but it could never be said that he was all things to all men: he was one thing to all men and that was "Bill Ironside."

"Whatever thy hand findeth to do, do it with thy might" could well have been his text, because among those "other qualities" could be counted an infinite capacity for work and an intense interest in his surroundings and in the work of others. This characteristic was so appealing. Although his work lay mainly in the investigation of the diseases of stock as a whole, yet he was deeply interested in the daily work of the general practitioner and he would bring a friend's dog many miles in his car to seek the advice of a colleague. He was generous and charitable in all respects. Endowed with very superior mental faculties, he was quick to learn and sum up and his deductions were rarely far wrong.

Ironside came of farming stock and was born in the village of Maud in Aberdeenshire in 1894. He was educated at Peterhead Academy.

Although he became a member of the Pharmaceutical Society in 1914, it is believed that he always wanted to be a veterinary surgeon. He did not practise his first profession for long, as in the same year he enlisted in the Royal Artillery and served in France throughout the war until he was wounded in 1918.

Of the years 1919 to 1923, which he spent at the "Dick" College, we know that although it was well within his power, he was no "pot hunter." He played a very good game of golf and bridge but while he played rugger he was not an exponent of the game; indeed, he was not greatly interested. It is recounted that when, on one occasion, the full back shouted to him to "keep up with that ball, Bill," his rejoinder was to march over menacingly and with a pointed bony finger exclaim "If you want anyone up with that ball then get up yourself." Respected by all and loved by many, he nevertheless eschewed much of the less austere aspect of college life.

During vacations he gained experience with local practitioners of whom the well-known William Hepburn was one. From Hepburn he developed that clinical sense which never faded.

In 1924, he was appointed to the staff of the Marischal College in Aberdeen. The almost inevitable journey over the border was to follow in 1925 when he commenced eleven years of devoted service to agriculturists and to his colleagues at the Midland Agricultural College. In 1933 the post of joint examiner in Pharmacology and Therapeutics became vacant and he was appointed by the Royal College. It was a post for which he was peculiarly well fitted. His early training as a pharmacist, coupled with his ability to probe a situation, constituted him a good examiner and he was above all things fair.

Of his work for the "National" let it be said that he served the Association in recent years on the Joint Veterinary Officers and Public Health and Parliamentary Committee, while in earlier years he was a member of the Appointments Committee.

The chief indebtedness of the "National" to him, of course, lay in his ever-readiness to place at its disposal his special knowledge in the field of chemistry and therapeutics. This was found of particular value by the Survey Committee in drawing up its reports, but many other reports issued by the Association and in process of preparation owe much to the ample and careful information he supplied. He was also very helpful to the Editorial Committee in checking material of a pharmaceutical nature received for publication in *The Veterinary Record*.

As secretary of the Derbyshire Association it was accepted by the members that Bill really *was* the Derbyshire and it grew under his hand.

In 1943 Messrs. Baillière Tindall & Cox invited him to revise and edit the long out of date Banham's "Veterinary Posology." This involved an immense amount of work but with characteristic pertinacity he accomplished the task.

This sketch would not be complete without a reference to his service, firstly in the L.D.V.'s and presently in the Home Guard. From the commencement he became Company Commander with the rank of Major, and with some 250 men he defensively organized an area comprising five villages.

He was a host in himself; indeed we are told that he filled any vacant post and did any job. He was clerk and storekeeper until some assistance could be obtained and his car was often stacked with rifles and the impedimenta of war.

He was keen on the marksmanship of the company and even after the war was over he continued to attend at the range.

As chairman of the Hoton Parish Council Bill Ironside "gathered everyone around" and the Badminton and tennis clubs were launched on his initiative. A Governor of the Burton School, he was very fond of children, thoroughly entering into their imagination. And so it was with all—he had that quality of "capturing" his listener, but he was always a good listener himself.

The possessor of such varied talents was likely to be an asset to any profession and in the minds and hearts of friends and colleagues who now mourn his loss, Bill's character and example will ever remain an abiding influence.

Funeral Services

The funeral was private and the service at Prestwold Parish Church was conducted by a personal friend and one time Vicar of Hoton, the Rev. A. J. Ison, who was assisted by the Rev. T. H. Evans.

The beautiful rural setting and the simplicity of the service combined to give that perfect atmosphere of peace at the last.

The cremation service which followed at Wilford Hills, Nottingham, was conducted by the Rev. T. H. Evans.

A memorial service was held at Prestwold Church on Sunday, November 3rd, when the Vicar, The Rev. T. Howden officiated.

There were present: Mr. H. W. Steele-Bodger, representing the Royal College and the "National," Mr. E. Wilkinson on behalf of the Derbyshire and Messrs. H. L. Torrance, W. Sheffield, A. Houston, R. H. Smythe, H. S. Cockburn and R. S. Cockburn.

Representatives were also present from the British Legion, the Home Guard, the Parochial Church Council, the Midland Agricultural College, the Research Station at Weybridge, the Longcliffe Golf Club, and Burton School.

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THE LATE CAPT. JOHN BELL, M.R.C.V.S.

Capt. John Bell, of 3, Honley Road, Catford, whose death on October 30th, at the age of 79 years, we recorded with much regret in our last issue, was the son of Jeffery and Mary Bell of Gatesgill, Carlisle. After qualifying at the "Dick" College in 1899, he went on to take his Fellowship in 1902.

After working for a time in Canada, he returned to practice in this country and in 1900 married Matilda, daughter of Henry Yates, who survives him. There is one son, Mr. J. G. Yates Bell, the well-known surgeon of Grosvenor Square.

In 1914 he joined the Royal Army Veterinary Corps and was for a time in charge of the Veterinary Hospital in Tunbridge Wells and later at Forges les Eaux. In 1919 he returned to practice, remaining at work until within 14 days of his death.

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THE LATE MR. J. N. REYNARD, M.R.C.V.S.

The *Falkirk Herald*, in a tribute to Mr. James Napier Reynard, to whose death reference has been made in our last two issues, observes that in his passing the Muiravonside district of Linlithgow has been bereft of one of its most highly respected residents, and the sense of loss experienced locally will be shared by his numerous friends over a still wider sphere.

A native of Cambuslang, Mr. Reynard was educated at Glasgow High School and continued his studies at the Veterinary College where he qualified as a veterinary surgeon. After assisting in his uncle's practice in Perth he later took up residence at Manuel House. Here he transferred his activities to farming at Manuel Mill Farm, where he specialized in the breeding of Shorthorns, Clydesdales and Hackneys. In this connection he enjoyed considerable success, outstanding achievements being the breeding of a Shorthorn bull which realized a high price at Perth, and also the renowned Hackney, "Cockle Roi," which, sold for a good sum, later attained considerable fame in America.

On retiring from farming, Mr. Reynard led a more secluded life, devoting most of his time to the development of the grounds of Manuel House where he found full scope for his love of horticulture. Possessed of a keen interest in, and high appreciation of art, he was a regular visitor at all the premier art exhibitions, and acquired an extensive collection of paintings of lasting worth. A golfer of no mean ability himself, he also found great pleasure in attending championship competitions.

"Of a retiring disposition, Mr. Reynard eschewed publicity, but his spontaneous generosity to all good causes was an outstanding feature of his character."

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GLASGOW VETERINARY COLLEGE

At the Prize Distribution of the Glasgow Veterinary College on November 4th, Mr. Alexander Murdoch, C.A., Chairman of the Board of Governors, mentioned the likelihood of a field station being set up near Glasgow, for Veterinary Research. A joint committee, composed of representatives of the Glasgow University, the West of Scotland Agricultural College, the Royal College of Veterinary Surgeons, the Department of Agriculture for Scotland, and the Glasgow Veterinary College, has been formed to study the difficulties connected with the erection of such a station, and also the future of veterinary education as presented in the Loveday Reports. Mr. Murdoch, in thanking the Racecourse Totalisator Charity Trust for the large funds donated by them, said that they would be put to good use aiding research work in the College.

The Lord Provost, Sir Hector M'Neill, addressed the students before the prize-giving and pointed out the advantages to be gained by a career in veterinary surgery. The prizes were then presented by Lady M'Neill.

R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

LIST OF SUCCESSFUL CANDIDATES

LONDON

Bishop, H. W.
Bulbeck, Miss E. C.
Cooper, R. P. (Credit.)
Devonald, L. J. R.
Drury, F. S.
Frank, C. J. (Credit.)
Goddard, Arthur.
Hartley, D. C.
Heynes, Michael.
Honhold, C. D.
Howard, J. W.
Howard, R. W.
Hughes, A. H.
Ibbetson, Miss J. A.
Jones, R. W.
Luckin, K. G.
Mander, J. H.
Oliver, A. C.
Oura, Peter.
Penhale, W. G. A.
Price, E. K.
Rawlins, J. A.
Simmonds, D. J.
Smith, E. H.
Smith, J. E.
Smithson, T. B.
Spalding, V. T.
Spittle, R. J. H.
Stockwell, Miss V. (Credit.)
Stubbins, A. G. J.
Sutherland, Miss A. M. B.
Teakle, J. A.
Thomas, T. G.
Toop, B. R. V.
Whittlestone, J. F. (Credit.)
Whittlestone, Peter.
Widrich, Miss S.

(To be continued.)

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THE CONSCRIPTION BILL

The Government's peace-time conscription plan will be embodied in one of the earliest Bills to be submitted in the new session of Parliament, which was opened by the King on Tuesday. As the Prime Minister informed the Parliamentary Labour Party and the General Council of the T.U.C., it will provide for the calling up of men between the ages of 18 and 23 for 18 months' compulsory service in the Forces, to be followed by five years' reserve service in the Territorial Army with a period of annual training. This new plan will come into operation on January 1st, 1949. It is understood to be a feature of this plan that young men should be given the option of doing their colour service either before or after their industrial apprenticeships, university education, or professional training.

In addition to informing his Parliamentary supporters and the trade union leaders of the Government's decision, the Prime Minister communicated the information to Mr. Churchill and some of his principal Opposition colleagues. The indications are that the Opposition will be in agreement with the principle and that they will support the Government in carrying the Bill through the House of Commons.

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U.S.A. REJECTS WORLD FOOD PLAN

SIR JOHN BOYD ORR'S WARNING

Following the notification given by Mr. Dodds, Under-Secretary for Agriculture, to the Preparatory Commission of F.A.O. that the United States have rejected the World Food Board Plan advocated by Sir John Boyd Orr, on the ground of "unsound finance," "Committee Two" are trying to reach agreement on alternative proposals for stabilizing prices by buffer stocks and other methods. In the meantime Sir John Boyd Orr, in the report which he has submitted to the United Nations on the work of F.A.O., observes that the difficulties of statesmen, probably arise from the amount of attention given to boundaries and other political matters that divide nations and are little understood by the common people. What the common people do understand is that two-thirds of the world's population are without adequate food. The majority of primary producers live in poverty, farmers in highly developed countries fear another slump, and businessmen are looking for markets that will balance the greatly increased productive capacity of industries stimulated by war. The close co-operation of all specialized agencies of the United Nations on a common front is needed to enable the peoples of the world to lead the full and healthy lives which are their common aspiration.

Sir John Boyd Orr warns the United Nations that without economy there is a grave danger next spring of a food crisis as acute as that of last spring. Because of the disappearance of UNRRA it would have more serious consequences in terms of widespread hunger and unrest.

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LICENSING OF BULLS

The Ministry of Agriculture has issued the statements reproduced below, showing the number of bulls licensed during the year ended March 31st, 1946, together with comparative figures for the preceding licensing year, and comments: "The appreciable reduction in the number of bulls submitted for licence indicates some tendency on the part of farmers to keep bulls in service over a longer

period than formerly. The lower percentage of rejections (12·6 per cent. in 1946 as against 16 per cent. in 1945) also suggests that breeders are being more discriminating in the bulls which they present for licensing.

"It is noticeable that there has been some change of emphasis from dairy to beef: there is a reduction in aggregate numbers of bulls licensed in the dairy breeds, whereas the beef breeds show an appreciable increase. It is too early to say how significant is this change, but it represents the first check to the movement towards milk and away from beef which has been consistently in evidence since 1939.

"During the year 77 bull owners were found guilty by the Courts of offences under the Acts and Regulations relating to bull licensing.

"On June 24th, 1945, Regulations permitting the issue of three types of bull licences came into operation. During the period to the end of March, 1946, 3,111 beef, 3,674 dairy (Official Milk Record) and 18,671 general class licences were issued: 1,199 dairy (Officials Milk Record) licences were subsequently issued in substitution for general class licences.

TABLE I

Particulars of the applications for bull licences dealt with in England and Wales during the years ended March 31st, 1945 and 1946:—

	Year ended March 31st, 1945	*Year ended March 31st, 1946*
Bulls licensed	36,403	33,385
Bulls rejected	6,918	4,803
Total	43,321	38,188

TABLE II

Particulars by Breeds of Bulls licensed in England and Wales during the years ended March 31st, 1945 and 1946:

	Year ended March 31st, 1945	*Year ended March 31st, 1946*
Aberdeen Angus	373	458
Ayrshire	2,422	2,696
Blue Albion	20	13
British Friesian	10,942	8,237
Devon	659	682
Dexter	19	26
Dun and Belted Galloway	—	7
Galloway	60	115
Gloucestershire	6	7
Guernsey	1,267	1,277
Hereford	1,281	1,740
Highland	2	—
Jersey	516	555
Kerry	10	11
Lincoln Red Shorthorn	1,146	1,242
Longhorn	2	3
Park	4	3
Red Poll	491	474
Shetland	1	—
Shorthorn	16,076	14,643
South Devon	664	642
Sussex	105	152
Welsh Black	323	401
Crossbred	14	1
Total	36,403	33,385

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

FOOT-AND-MOUTH DISEASE:

Suffolk (*East*).—Sand Pit Farm, Bruisyard, Saxmundham, Suffolk (Nov. 9th).

SWINE FEVER:

Lincs. (*Kesteven*).—Wayside Farm, Walcott, Billinghay, Lincoln (Nov. 6th).

Lincs. (*Lindsey*).—Clarke's Piggeries, St. Paul's Lane, Lincoln (Nov. 7th).

SHEEP SCAB:

Cumberland.—Greengillhead, Penrith, Cumberland (Nov. 4th).

Derbyshire.—Middle Ollerbrook, Edale, Sheffield, Yorks. (Nov. 4th).

Westmorland.—Widewath and Scales, Helton, Penrith; Woodfoot Farm, Askham, Penrith; Seat Farm, Pooley Bridge, Penrith; Dalefoot, High Drybarrow and Scar View, Bampton, Penrith, Cumberland (Nov. 4th); Brinn's Farm, Shap, Penrith, Cumberland (Nov. 7th).

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s. d.	*Post free* s. d.
COMMAND PAPERS (Session 1945-46):		
(6935.) Africa. Colonial Office Trusteeship Territories in Africa under United Kingdom Mandate. (Revised Texts)	0 2	0 3
AGRICULTURE AND FISHERIES, MINISTRY OF:		
Leaflet, Advisory, No. 161. Rabbits for Flesh and Fur — Each	0 1	0 2
Doz.	0 9	0 11
Leaflet, Advisory. No. 298. Salmonella Infection of Poultry — Each	0 1	0 2
Doz.	0 9	0 11
HOUSE OF COMMONS PAPERS (Session 1945-46):		
186. Statutory Rules and Orders, etc., Select Committee on. 3rd Special Report	0 2	0 3
STATUTORY RULES AND ORDERS, 1946:		
(1716.) Feeding Stuffs. Order, October 22nd, amending the Feeding Stuffs (Regulation of Manufacture) Order, 1944	0 2	0 3
MEDICAL RESEARCH COUNCIL:		
Special Report Series, No. 256. The Cultivation of Viruses and Rickettsiae in the Chick Embryo (by W. I. B. Beveridge and F. M Burnet). July 18th, 1946. (45-8-56)	2 0	2 2

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President Truman has set up a Scientific Research Board to study governmental scientific research and development activities in the U.S.A. "to ensure that scientific personnel, training and research facilities of the nation are used most effectively in the national interest."

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

Notice to Correspondents

The Editorial Committee regrets that, the paper supply situation having deteriorated, it has become necessary to ask correspondents again to accept a limitation on the length of letters submitted for publication. Accordingly, contributors to our Correspondence Columns are requested to note that, until further intimation is made, their communications must not exceed 350 words.

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THE R.C.V.S. FELLOWSHIP DIPLOMA

Sir,—Mr. Welsh's suggestion that the Fellowship diploma be awarded for a high degree of proficiency in professional work is an excellent one. Now that the universities are to play a large part in our veterinary education it would be a good thing if the F.R.C.V.S. were awarded on similar lines to the F.R.C.S., as this would maintain the prestige and structure of the R.C.V.S. for all time. As rapid strides continue to be made in Surgery it might be awarded for work in this field alone. This leads one to wonder what is to be the qualifying degree which the universities are to award, as little seems to have been mentioned about this. At the moment they award a B.Sc. (Vet. Sci.), but this gives no indication of the scope and duration of the course—an ordinary B.Sc. taking at the most only three years. It is to be hoped that the qualifying degree will be on the lines of the M.B., B.S., as applied to Medicine or the B.D.S. as applied to Dental Surgery, and will be possibly B.V.M., B.V.S. Such a form of qualification would permit persons who wished to gain extra proficiency in subjects other than Surgery to take a D.V.M.

For some time now we have heard very little indeed of the future of veterinary education with the exception of ominous rumours which we hope are only rumours. It is vitally important in this crucial interim period, when plans are being drawn up which will affect the whole future of veterinary education, that our leaders, whatever their previous views, should strive to secure the best for the future of the profession.

Yours faithfully,

40, Cholmeley Park, Highgate, N.6. KATHLEEN M. M. SMITH.
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